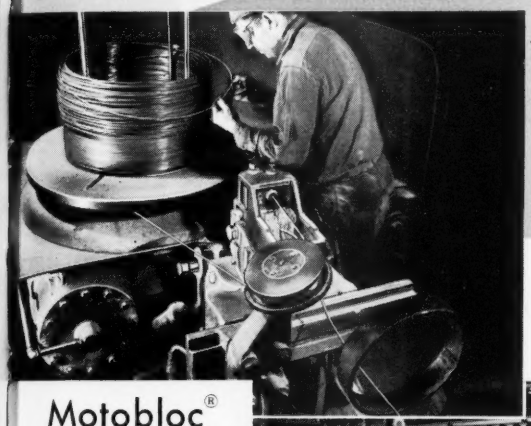
# WIRE AND WIRE PRODUCTS

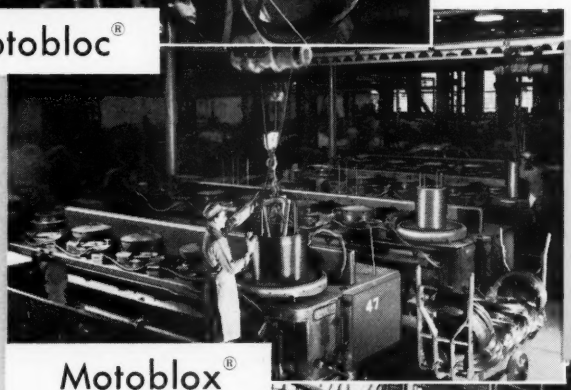
APRIL 1953


MEET TODAY'S WIRE PRODUCTION DEMANDS...

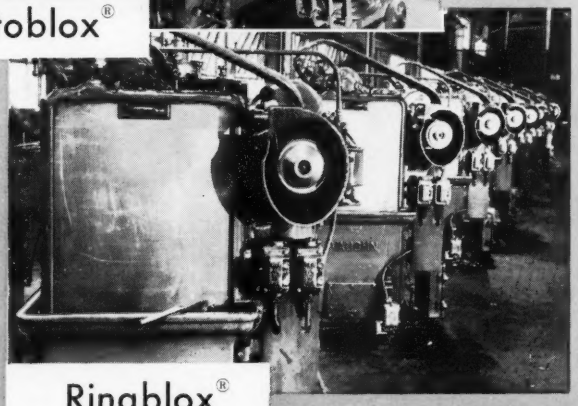
....with Today's Fine Production Equipment!



Motobloc®



Motoblox®



Ringblox®

Vaughn®

WIRE DRAWING MACHINERY

You *need* the finest equipment to handle high-volume wire production profitably and dependably—and you can't buy better than VAUGHN! Let us sit down with you on your current planning, and develop the productive facts you can use!

The Vaughn Machinery Co.

Cuyahoga Falls, Ohio, U.S.A.

COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.

"Quick on the Draw"


OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

# The NEW Bulletin on WILSON Wire Annealing

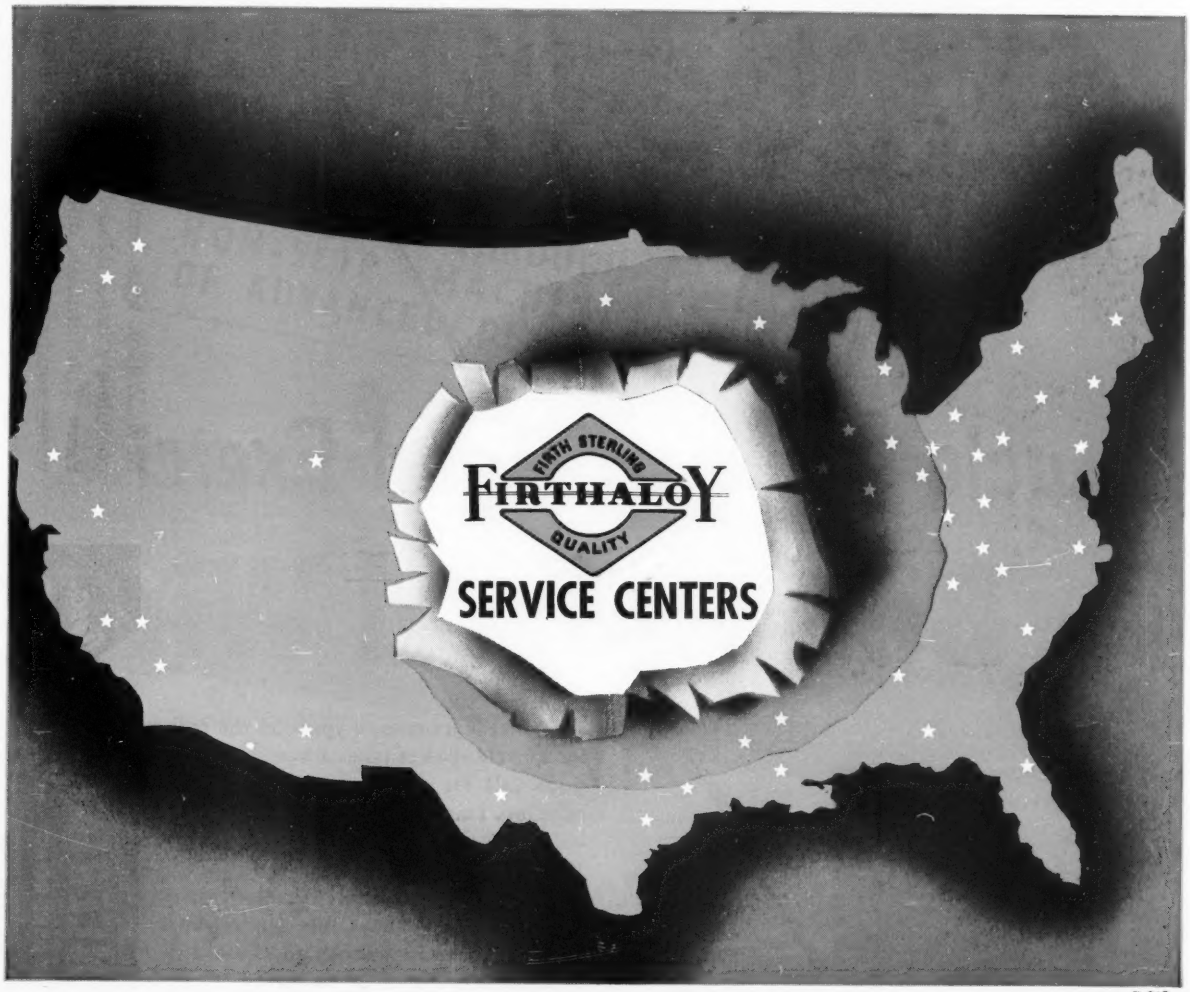
Lee Wilson **ENGINEERING** Co., Inc.

20005 WEST LAKE ROAD • CLEVELAND, OHIO
Telephone ED-1-6600

BELL TYPE FURNACES ★ RADIANT TUBE HEATING ★ ANNEALING PROCESSES

Now, Wilson wire annealing equipment comes to you completely assembled from the Lee Wilson Assembly Plant. The furnaces and bases are bricked, piped and wired, ready for immediate installation. This is another step in Wilson leadership in the wire annealing field.

# NOW··
## *another expansion of* **FIRTH SERVICE**




R-268

**The Country's Leading Die Makers are Firthaloy Service Centers**

The overwhelming demand of American Industry for Firthaloy carbide dies has made it desirable to expand services through a new and closer working relationship with the country's leading diemakers, can assure you faster delivery, better service and lower cost. When you specify Firth Sterling quality carbide, backed by years of diemaking experience for these products.

- Rough Drilled and Finished Die Nibs
- Finished Round Dies
- Finished Shape Dies
- Finished Mandrels and Mandrel Nibs
- Finished Deep Draw and Cartridge Case Dies
- Finished Cold Heading and Extrusion Dies
- Side and End Blocks
- Quills and Cut-Off Knives
- Compacting Dies
- Finished Nail Dies and Cutters

As always Firth Sterling maintains a sales and production engineering service, and development facilities to design, fabricate, and test new carbide products in your plant.

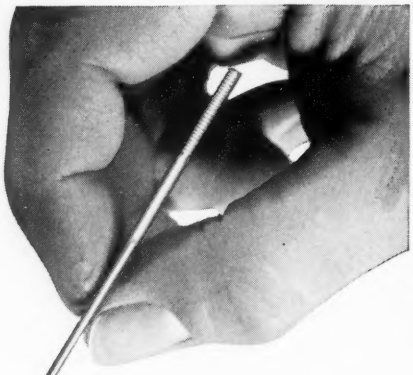
*High Speed Steels • Tool & Die Steels • Stainless Specialties*
*High Temperature Alloys • Sintered Tungsten Carbides*
*Chromium Carbides • High Temperature Cermets • Firth Heavy Metal*

**OFFICES* AND WAREHOUSES: HARTFORD NEW YORK* DETROIT CLEVELAND DAYTON* PITTSBURGH* CHICAGO BIRMINGHAM* LOS ANGELES PHILADELPHIA***

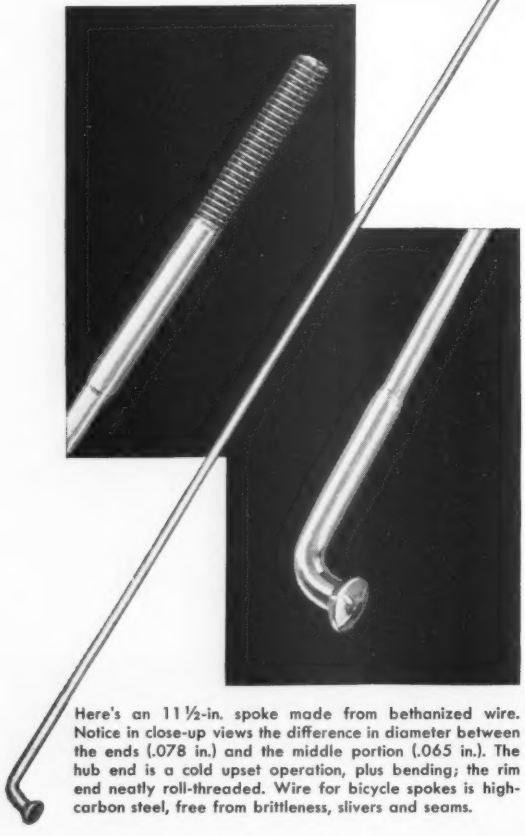
**In Canada: Chapat Engineering & Sales, Ltd. • 25 Sawyer Rd., Hamilton, Ontario, Canada**

**Firth Sterling INC.**

**GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.**



# Bicycle Spokes...Good Exercise for Bethanized Wire



Here's an 11½-in. spoke made from bethanized wire. Notice in close-up views the difference in diameter between the ends (.078 in.) and the middle portion (.065 in.). The hub end is a cold upset operation, plus bending; the rim end neatly roll-threaded. Wire for bicycle spokes is high-carbon steel, free from brittleness, slivers and seams.

From the moment it spins off the coil, wire used for bicycle spokes takes a beating. Forming operations call for swaging, upsetting, threading and bending. Later, as a hard-working spoke, the wire must shake off kicks, collisions and, toughest of all, corrosion.

Manufacturers choose bethanized wire for rugged jobs because it comes through severe fabrication without losing its smooth good looks or its ability to fight rust.

Bethanized wire's top feature is its zinc coating —99 pct pure, of uniform thickness, highly ductile, and tightly adhering to the steel base. Bend the wire, twist it, even draw it through a series of dies —the zinc doesn't crack, flake or peel. Rust finds no inviting thin spots anywhere along the wire.

Next time you have a difficult forming job or a corrosion problem, try bethanized wire. The nearest Bethlehem sales office will be glad to give you more information. Or write to us at Bethlehem, Pa.

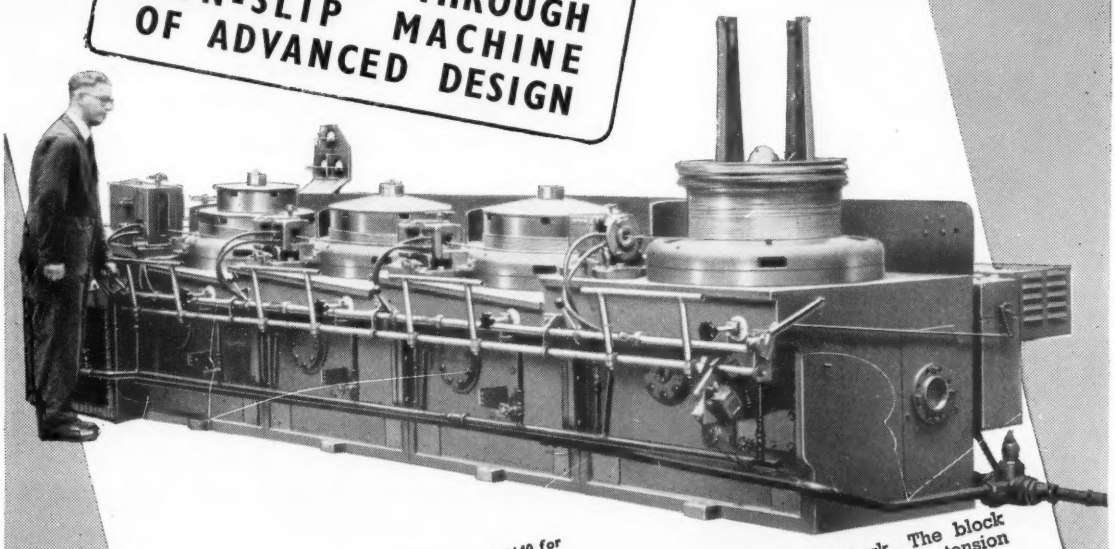
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

*On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation*

BETHLEHEM STEEL

# The PATHFINDER

## A STRAIGHT THROUGH NON-SLIP MACHINE OF ADVANCED DESIGN



Special 4/5 Block Pathfinder Type 22/40 for drawing mild steel from 5 s.w.g. at speeds up to 2,250 feet per minute.

1. The wire passes straight through the machine from block to block. The block speeds are automatically regulated by our patented electrical gear. Wire tension between blocks can be independently set.
2. Tilted blocks enable sufficient wire to be accumulated on each block to allow for ample cooling and yet pass through the die to the bottom of the following block in a straight line.
3. Almost infinite drafting can be obtained at each die.
4. The machine is ideal for use with a heavy spooler carrying up to about two tons of finished wire.
5. Owing to the absence of all guide pulleys, multi-holing from very heavy inlets is perfectly feasible.
6. A standard FIVE BLOCK Heavy machine is available for high carbon with the following specification:

| | Type 30/60 |
|---|---|
| Block Diameter. | 30" |
| Maximum inlet. | .500" |
| Finish. | .250" — .102" |
| Drawing Speeds. | 600—1200 feet per minute. |

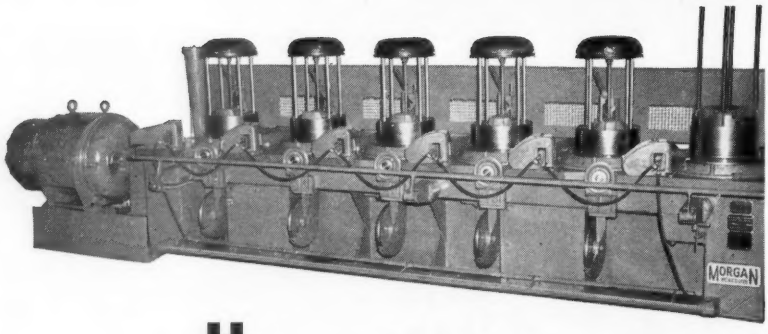
**MARSHALL RICHARDS MACHINE CO. INC.**

1100 SOUTH BROAD STREET · TRENTON 10 · NEW JERSEY
Telephone: TRENTON 9478 · Telegrams: MARICH TRENTON

MR-52

# MORGAN CONNOR

## WIRE MACHINES




HERE are your benefits from an investment in Morgan-Connor Wire Machines:

1. Sound basic mechanical design and workmanship.
2. High production at low cost because the efficient air cooling system permits the drawing of all sizes of wire at high speeds.
3. High quality wire because adequate cooling does not allow the heat to build up to high temperatures during drawing.
4. Savings on power because only one motor is used.

Why not let a Morgan-Connor representative give you the whole story?

**MORGAN CONSTRUCTION CO.**
**WORCESTER, MASSACHUSETTS**

WM-72

# WIRE AND WIRE PRODUCTS*

Reg. U. S. Pat. Off.

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 28 APRIL, 1953 No. 4

Designated as Official Publication By The Wire Association


## Contents


Editor's Desk ..... 357

A Note on The Performance of "The Increasing-Load Abrasion Tester" by F. Levi ..... 359

The Woodscrew and Its Manufacture by Karl Rennen ..... 363

Signal Corps Develops New Lightweight Carrier Cable ..... 367

Moisture Resistance of Insulated Conductors—A General Review by R. C. Graham ..... 370

Safety in Wire Drawing Operations by A. E. Asel ..... 374

Wire Association Spring Meetings

Trenton Meeting ..... 350

Montreal Meeting ..... 355

San Francisco Meeting ..... 369

Government Wire Production Information ..... 379

Outstanding Personalities of the Wire Industry ..... 389

A Review of Recent Wire Patents ..... 401

Index to Advertisers ..... 424

Where-to-Buy ..... 425-428



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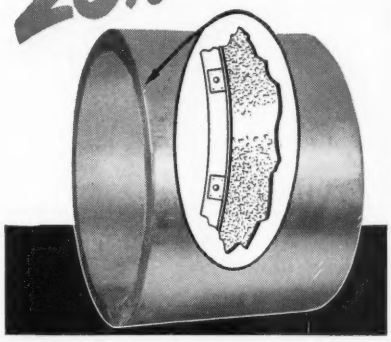
extra STRENGTH SERVICE and 20% LESS WEIGHT



NILES

"Reinforced Type"

FLANGED STEEL TRAVERSES

for wire and cable

. . . have extra strength where it is needed most—at bolt holes and base of the flange. This reinforcing makes possible the use of lighter gauge steel, saving up to 20% in weight while increasing overall strength.

Niles Flanged Steel Traverses have given as much as sixteen years' service without refinishing or major maintenance, according to actual experience records. In many cases their use has doubled the number of trips per reel before cut downs or scrapping of wooden heads.

They are manufactured in sizes up to 56" diameter and 48" traverse —in plain, painted or hot dip galvanized finishes—as light as 18-gauge steel. Width of flange and number of bolt and drain holes are furnished to your specifications. Available for prompt delivery. Write for prices.

• • •

*Manufactured Under License Arrangements With Western Electric Co., Inc.*

REPUBLIC STEEL

PRESSED STEEL DIVISION
REPUBLIC STEEL CORPORATION
NILES, OHIO

# Neutral Salt Baths Containing Additives React With Hot Rolled Scale On Stainless And Other Steels To Eliminate Descaling

| PRODUCT | Melting Point | Operating Temperature Range |
|---|---|---|
| **HARDENING 185-10** (Granular) | 820°F. | 1000-1500°F. |

A Neutral Hardening Bath having a specific weight of 135 lbs. per cubic foot at 1500°F. (2.17 sp.gr.); specific heat 0.208 at 1050°F.

| | | |
|---|---|---|
| **HARDENING 127-11 and 127-12** (Granular) | 1110°F. | 1300-1650°F. |

A water soluble neutral hardening bath having a specific weight of 110 lbs. per cubic foot at 1550°F. (1.70 sp.gr.); specific heat 0.165 at 1275°F.

| | | |
|---|---|---|
| **HARD BRITE AA-10** (Granular) | 1380°F. | 1450-2000°F. |

A Neutral Hardening Bath for higher temperature work, having a specific weight of 1.57 lbs. per cubic foot at 1850°F. (2.43 sp.gr.); specific heat 0.169 at 1550°F.

| | | |
|---|---|---|
| **HIGH SPEED PREHEAT 13-17-10** (Granular) | 1040°F. | 1200-1700°F. |

A Neutral Salt Bath for tool steels, high speed steels, high carbon high chrome or air hardening steels having a specific weight of 140 lbs. per cubic foot at 1500°F. (Approx. 2.20 sp. gr.); specific heat 0.170 at 1500°F.

| | | |
|---|---|---|
| **HIGH SPEED 17-24 AA-10** (Granular) | 1700°F. | 1750-2350°F. |

A new Salt Bath for high speed hardening which requires no rectifier for maintaining neutrality.

Specific weight 160 lbs. per cubic foot at 2000°F. (2.651 sp.gr.); specific heat 0.159 at 1850°F.

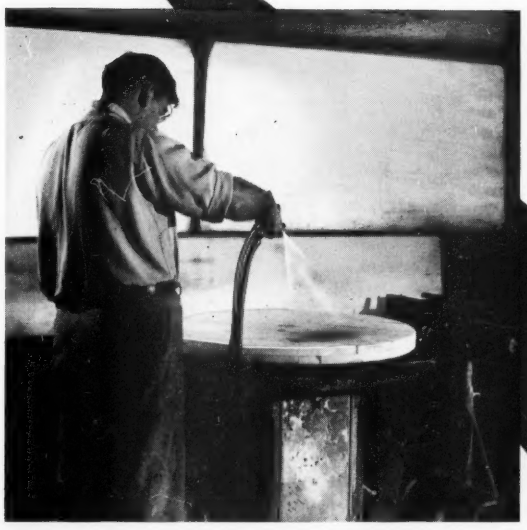
Write us for specific details in relation to your problem.

## THE A. F. HOLDEN COMPANY

**P. O. Box 1898**
**New Haven 8, Conn.**

**11300 Schaefer Highway**
**Detroit 27, Michigan**

# GET YOUR REELS AS ORDERED



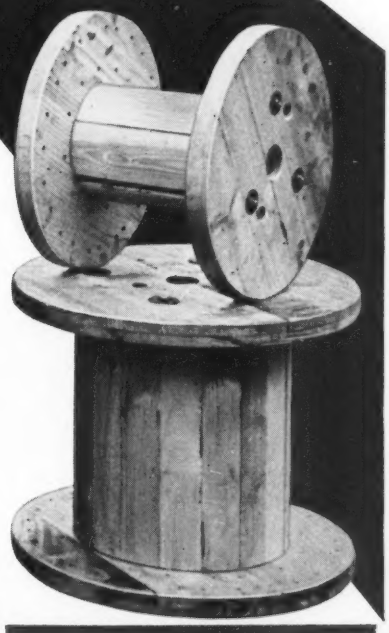
Above: reels being painted

## BRIDGE WOOD REELS SHIPPING AND SHOP—ALL TYPES

12" to 96" in diameter, knocked down or assembled; returnable or non-returnable; wood heads for steel drums. All precision-made to your specifications, strong for severe handling, low in cost.

## EVERY MILL HAS ITS OWN REEL SPECIFICATIONS

Bridge is equipped to meet your specifications accurately and without delays. Our straight-line production methods and efficient automatic equipment turns out reels accurately, fast and at low cost. Every reel is a quality product, designed for the toughest conditions of service. Bridge reels come to you "as ordered" both as to specifications and delivery dates.



**PLUS A SPEEDY SHIPPING SERVICE**

Bridge delivers by truck to your door within a radius of 200 miles from the plant. Fast freight will bring you Bridge reels in 5 days or less east of the Mississippi.

Because of the unprecedented demand for Bridge Reels, we are not at present able to give our usual prompt service to all customers. We are taking steps to remedy this situation and ask your kind indulgence meanwhile. Thank you for your patience.

**BRIDGE**
MANUFACTURING CO.
HAZARDVILLE, CONN.
Phone Thompsonville, 3375

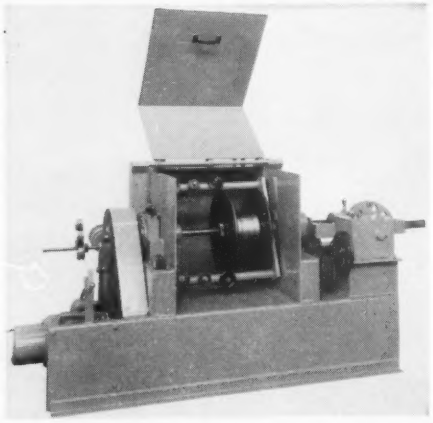
Let us quote on your reel needs. Send your specifications. Better yet, visit our plant and see how and why our reels are made so well at so low a cost.

*Attention . . .*

# PLASTIC AND RUBBER EXTRUDERS

***of the Wire Industry!***

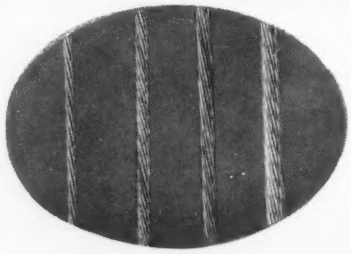
## At last, it is now possible to strand any number of wires *with perfect concentricity.*



**Shown at left:**
**COOK HIGH SPEED BUNCHER.**
**1400 twists per minute.**
**Reel Size: 21" x 8 1/2".**
**Reel Capacity: 350 pounds.**

The Cook Manufacturing Company has now succeeded in producing a highly versatile bunching machine for the wire industry. This new COOK BUNCHER has successfully formed bunched strands of 7, 10, 16, 19, 41, and 65 wires with such concentricity as to enable its passage through an extruding die of only 1 mil clearance.

**The illustration at the right is an example of 7, 10, 16, & 26 strands of #30 tinned copper. While the 7 strand is a concentric lay, the others theoretically are not; yet they are formed with perfect concentricity on the new Cook Buncher.**



7/30 10/30 16/30 26/30

With this Cook Buncher, the wire industry has an extremely versatile machine. When used for straight bunch stranding the Cook Buncher produces bunched wire with such concentricity that the leader die used on an extruder would have as small minimum of clearance as used for solid wire.

Rope stranding is also possible with this machine without the addition of space eating back twisters. As an example, a rope strand of 7 x 7/30 tinned copper wires was formed on the buncher with perfect concentricity at a production rate of 7,000 ft./hr.

***Write today for descriptive literature giving details of construction and performance of this high speed concentric bunching machine.***

**OTHER COOK EQUIPMENT**

• Wire Drawing Machines • Bunchers • Twisters • Wire String-Up Machines • Enameling Take-Ups and Pay-Offs
• Enameling Machines • Cabling Machines • Spoolers • Tinning Take-Ups and Pay-Offs • Tinning Pots
• Wrapping Machines • Special Machinery

# COOK MANUFACTURING COMPANY

**265 NORTH 9th STREET** **PATERSON 2, N. J.**

Steelskin
LUBRICANTS

**R. H. MILLER**
Company, Inc., Homer 1, N. Y.

SOAPS AND COMPOUNDS FOR WIRE DRAWING, TUBE DRAWING, DEEP DRAWING AND STAMPING.

# DIAMOND DIES

This is Number 1 of a series of ads in which we are stating some facts that every buyer of Diamond Wire Drawing Dies should keep in mind when buying these indispensable tools of our wire industry.

## *Are You Having Die Trouble?*

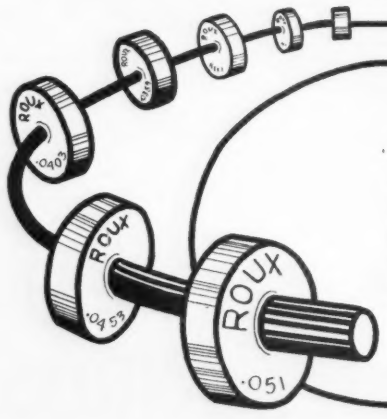
**Consult us with your problems and we will be glad to give you the benefit of many, many years experience in the manufacture of diamond dies.**

### PRACTICAL FACTS ABOUT DIAMOND DIES

First, when you buy a diamond die are you primarily buying a diamond? The answer is obviously "No." You are buying a tool to do a certain specific job and the reason you specify "diamond" die is because experience has taught all of us that the diamond is the most economical die to use in certain size ranges. Actually it would not matter if the die was made out of glass or ceramic or steel so long AS IT DID YOUR JOB AS ECONOMICALLY and as well as a diamond!

However, many people do not realize that the SIZE of the diamond used is not the primary consideration in evaluating a diamond die as to its performance or recut life. There are two other very vital considerations—QUALITY and SHAPE of the diamond.

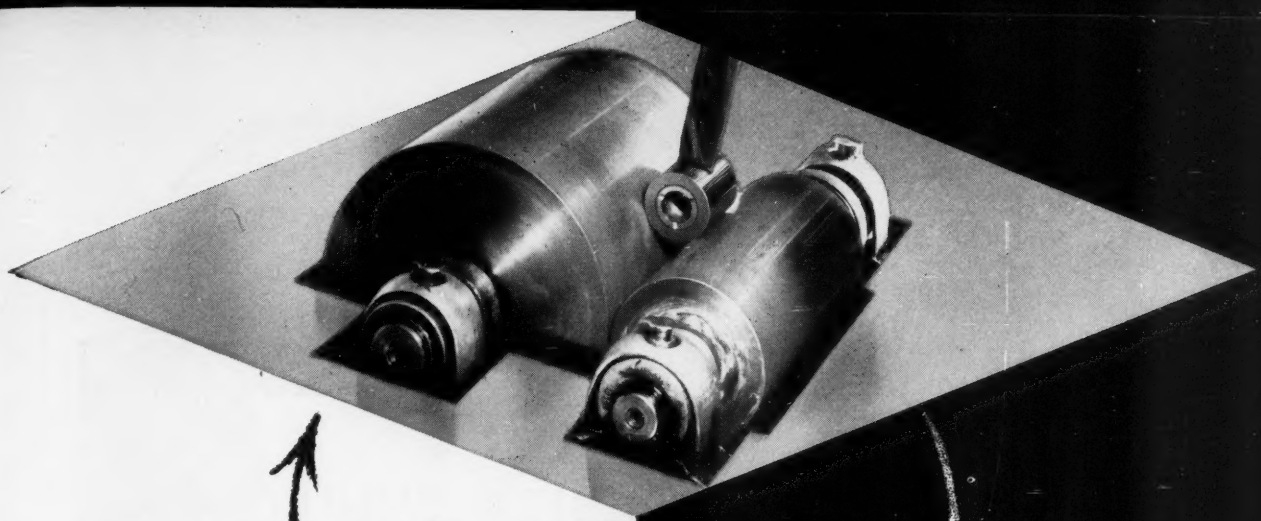
***In our next ad we will discuss these vital factors.***



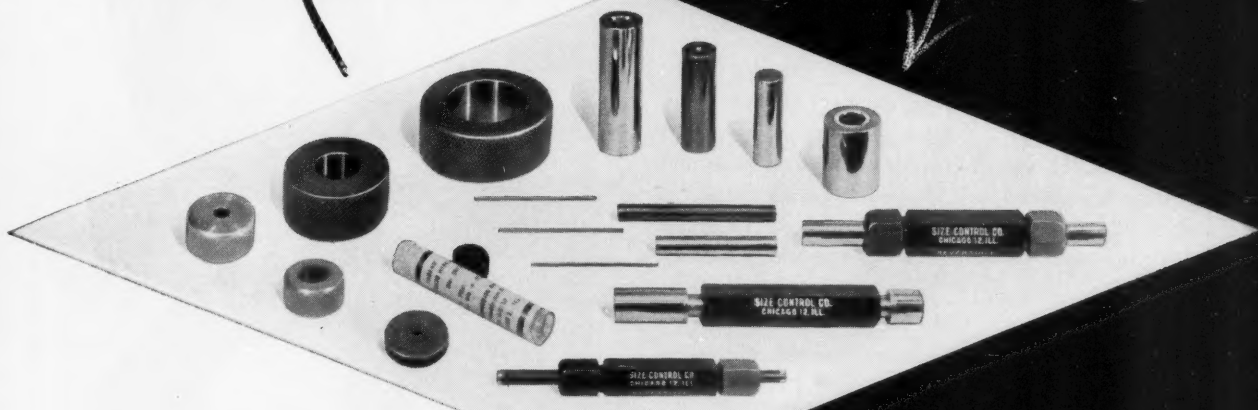

### REMEMBER

**That ROUX has never compromised with quality. The diamonds are the best obtainable, but the extra cost is more than justified by the longer life they give you. And every diamond is drilled to perfect concentricity. When you buy ROUX dies you can be assured of getting the very best.**

**ROUX WIRE DIE WORKS, INC.**
**ORISKANY, NEW YORK**



Precision finishing with a Precision Abrasive




At the Size Control Company . . . Chicago, Illinois

Precision gage production
presents a difficult finishing problem.
A fine, long wearing finish must be achieved just
as the piece is brought to exact size—there is no excess
material left for refinishing if a scratch develops. Only the finest, most
reliable abrasives can be used. That's why, at Size Control Company, they . . .

## Finish with Diamond . . . ELGIN Diamond!

**ONLY ELGIN DIAMOND IN DYMO**
is precision graded right in the Elgin laboratories

ORDINARY DIAMOND

ELGIN DIAMOND

ABRASIVES DIVISION
ELGIN NATIONAL WATCH COMPANY

ELGIN, ILLINOIS
Dept. G

# What do YOU make that takes wire?

If you make sieves or staples, screws or screens—whatever you make that takes wire—we're pretty sure to have the kind of manufacturers wire you need. Round, flat, square . . . hard, soft, ductile . . . plain, tinned, or bright finished . . . carbon, alloy, or stainless. Altogether we produce over 400 different types of wire which are suitable for practically all everyday wire applications.

But, if you need a special kind of wire, we can supply that too. Our modern plant facilities enable us to draw wire to meet the exact specifications of a special order, and our trained metallurgists are always ready to assist you with any manufacturing problems you may have.

We've been in the wire-making business more than one hundred years, and all of our experience is at *your* service . . . to help you do an easier and better fabrication job.

*If you make it of wire... make it of the best!*

## U·S·S AMERICAN MANUFACTURERS WIRE

AMERICAN MANUFACTURERS WIRE

**AMERFINE**—*High-quality fine wire.*

**AMERSPRING**—*music steel spring wire.*

**AMERLOY**—*alloy heading wire.*

**AMERTEMP**—*heavy-duty oil-tempered wire.*

**AMERHEAD**—*uniform heading wire.*

**AMERSTITCH**—*extra-tough metal stitching wire.*

USS TRADE MARK

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO

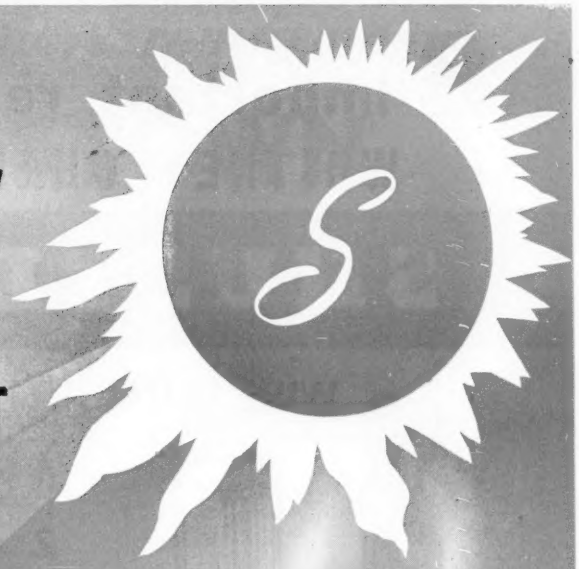
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS

TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

# *STAYS BRIGHT AS DAY ! WITH*

# STANDARD'S BRIGHT WIRE COMPOUNDS



**STANDARD INDUSTRIAL COMPOUNDS COMPANY** has pioneered most of the outstanding contributions to better wire drawing through better lubricants. Consult with **STANDARD** for the solution of your difficult problems. We welcome your inquiries.

## STANDARD WIRE DRAW NO. 15

A new and different Compound for wet drawing, made from new and different materials that have a natural affinity for metals, a natural wetting-out characteristic, without the addition of a wetting agent.

Protects the wire from oxidizing for considerably longer periods than conventional compounds. Preserves the bright finish on copper coated or liquor finished wire and prevents tarnish on copper or brass wire for longer periods of time.

Below are some of the advantages of this compound:

**A. Small amounts needed. Due to the natural affinity for metal small amounts of this compound are needed. Draws high carbon wire at high speeds with a fat content as low as .30 per cent, because of this affinity for metal and the natural wetting-out characteristics.**

**B. Low pH value.**

**C. Protects steel wire from rusting and copper coated and liquor finished steel wire from oxidizing. Protects copper and brass wire from tarnishing.**

**D. A clean compound. Keeps equipment clean and drawn wire has a clean finish.**

Contact one of our representatives below or our home office for details on this new compound and a sufficient quantity for test will gladly be furnished.

**Bruce W. Siemon**
**2400 Morrow Pl.**
**Pittsburgh 34, Pa.**

**John A. Moritz, Jr.**
**4600 W. Ferdinand St.**
**Chicago 44, Ill.**

**Earl A. Bowers**
**5536 Lisette**
**St. Louis, Mo.**

**Charles P. Orr**
**Caledonia Park**
**Fayetteville, Pa.**

**Standard Industrial Compounds Co.**
**Millbury, Mass.**
**Arthur J. O'Mara**

*wire drawing lubricants* *Standard* **INDUSTRIAL COMPOUNDS CO., INC.**

**4600 WEST FERDINAND STREET**
**CHICAGO 44, ILLINOIS**

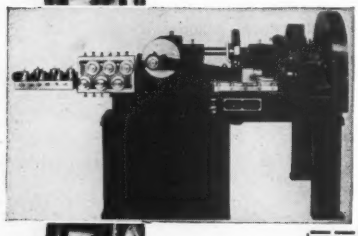
# 8 important reasons *why* WHITNEY CHAIN CO. *uses*

# SHUSTER AUTOMATIC SLIDE FEED

## WIRE STRAIGHTENING and CUTTING MACHINES

Whitney Roller Chain Pins, made on SHUSTERS, can be stood end on end, the cut is so true and clean.

1. **Each SHUSTER delivers 7500 Whitney Roller Chain pins per hour.**
2. **Whitney Chain standards of length tolerances are easily maintained.**
3. **Straight lengths and square cut ends speed up assembly operations.**
4. **Each SHUSTER can be set for lengths from 0 to 10″.**
5. **Fully automatic controls increase man-hour production.**
6. **Uses economical mill coiled rod stock. Costs less than mill straightened stock.**
7. **Pins are made as needed, simplifying inventory—keeping production on schedule.**
8. **SHUSTERS have generation-long dependability.**



SHUSTER Automatic Slide Feed Machines such as these used by Whitney Chain, are specifically designed for accurate and square cutting of short lengths. SHUSTERS are available to handle round stock from .025″ dia. to 11/16″ dia. and up to 40′ cut off length. Also shapes and tubing.

Mfd. by **METTLER MACHINE TOOL, INC.**
132 W. Lawrence St., New Haven, Conn.
NEW YORK OFFICE: Eleven Broadway, Tel.: WHitehall 4-5480

**Technical Data on Request**

Mettler Machine Tool, Inc.
132 W. Lawrence St., New Haven, Conn.

Gentlemen: Please send us technical data.
We use wire from ..... ″ to ..... ″ dia. in lengths from ..... to .....
Name: .....
Company: .....
Address: .....

**SHUSTER** *Automatic* — *Since 1866* — WIRE STRAIGHTENING AND CUTTING MACHINES

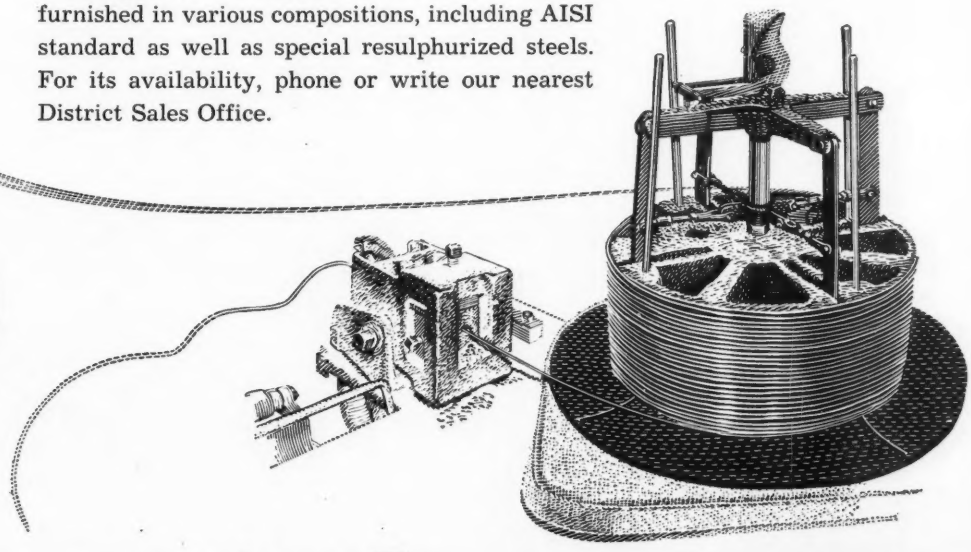
*Custom built to customers' requirements...*

# YOUNGSTOWN SCRAPLESS NUT WIRE

●Scrapless Nut Quality Wire is not an ordinary steel for common applications. It is a custom-built product designed to meet customers' specific requirements for cold heading, cold forging, cold punching, cold expanding and threading, in the production of a variety of nut shapes on continuous cold heading and cold forging machines.

Every step of its manufacture is carefully controlled—from the melting furnaces to the final drawing operation on the wire machines. Each coil of wire is subjected to close inspection and rigid tests with modern electrical testing apparatus.

Youngstown's Scrapless Nut Quality Wire is furnished in various compositions, including AISI standard as well as special resulphurized steels. For its availability, phone or write our nearest District Sales Office.



QUALITY YOUNGSTOWN SERVICE

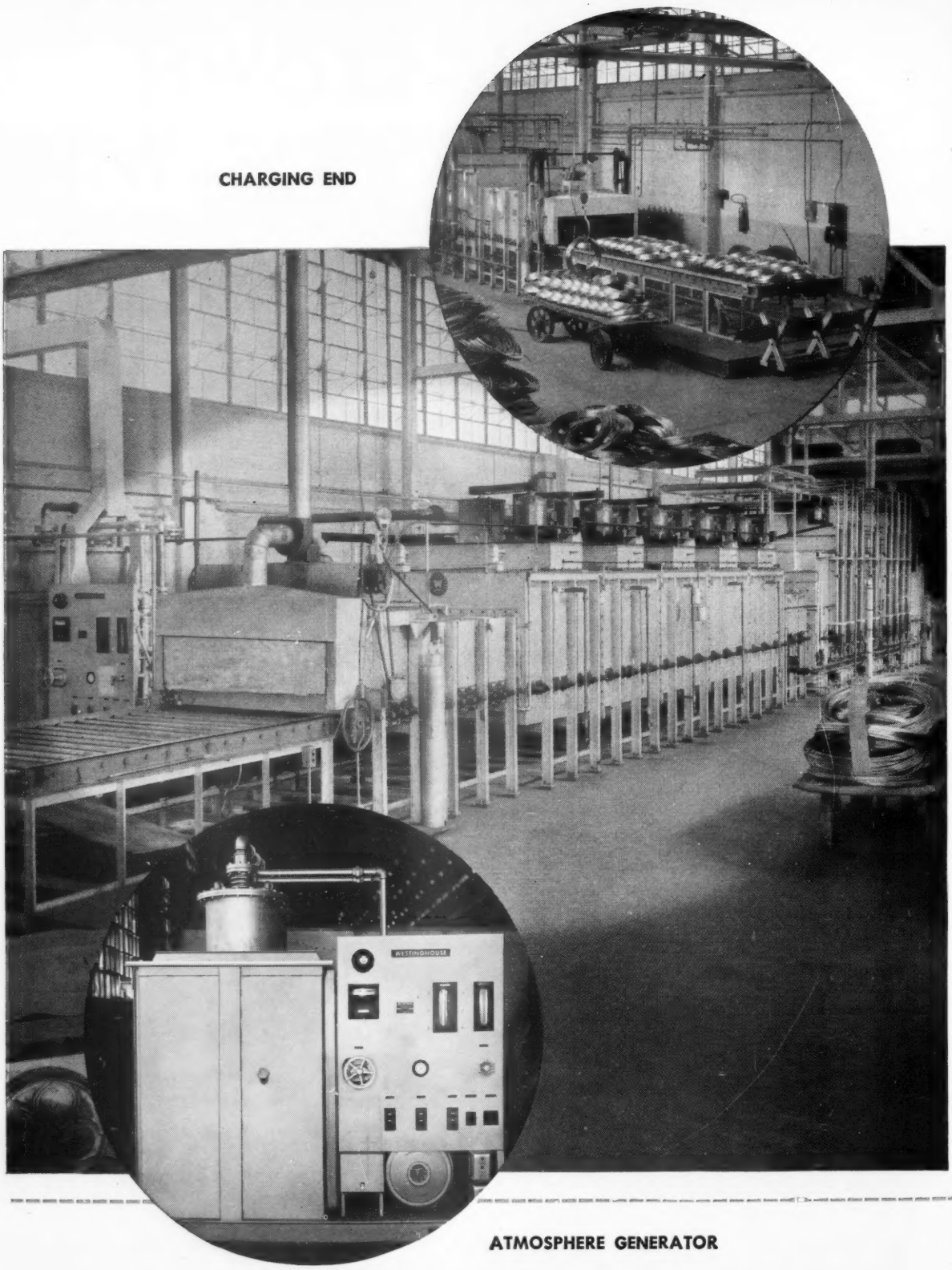
**Youngstown SCRAPLESS NUT QUALITY WIRE**

**THE YOUNGSTOWN SHEET AND TUBE COMPANY** *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices: Youngstown, Ohio - Export Office: 500 Fifth Avenue, New York 36, N. Y.

PIPE AND TUBULAR PRODUCTS - CONDUIT - BARS - RODS - COLD FINISHED CARBON AND ALLOY BARS - SHEETS - PLATES - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RAILROAD TRACK SPIKES

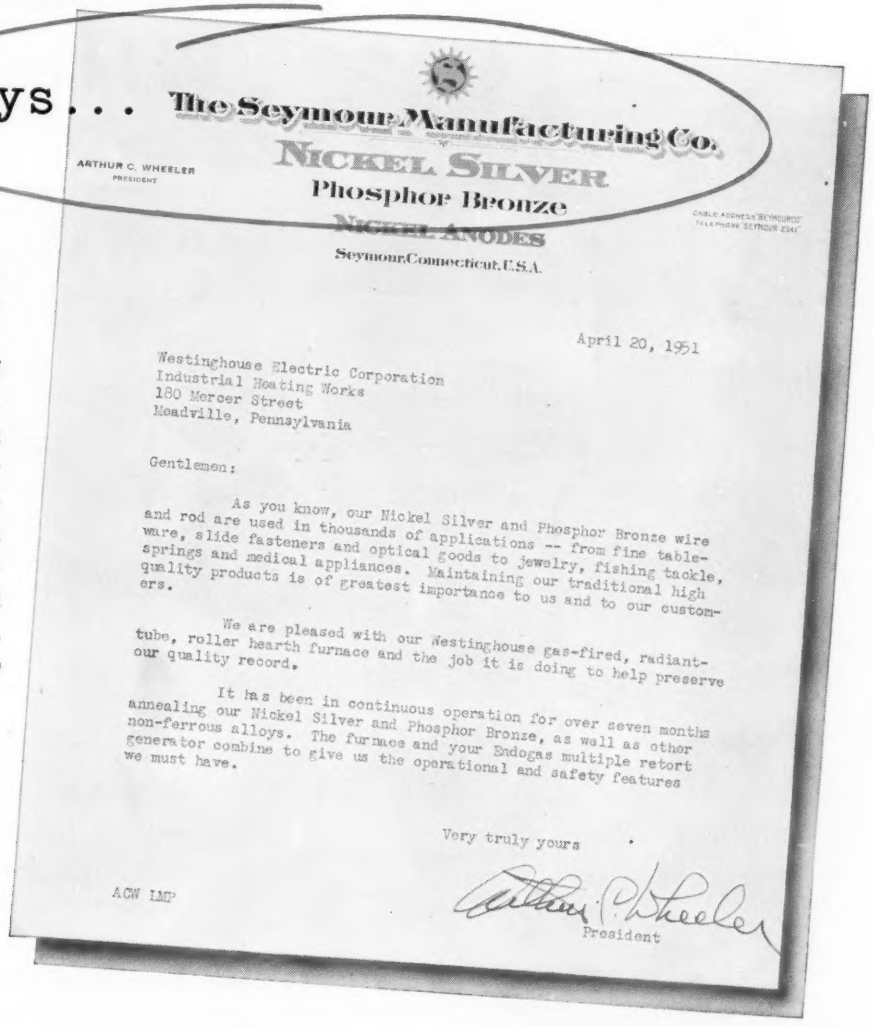
CHARGING END




ATMOSPHERE GENERATOR

# "Gives us operational and safety features we must have"

says . . .



The Seymour Manufacturing Co.
Seymour, Connecticut, U.S.A.

NICKEL SILVER
Phosphor Bronze
NICKEL ANODES

ARTHUR C. WHEELER
PRESIDENT

April 20, 1951

Westinghouse Electric Corporation
Industrial Heating Works
180 Mercer Street
Meadville, Pennsylvania

Gentlemen:

As you know, our Nickel Silver and Phosphor Bronze wire and rod are used in thousands of applications -- from fine tableware, slide fasteners and optical goods to jewelry, fishing tackle, springs and medical appliances. Maintaining our traditional high quality products is of greatest importance to us and to our customers.

We are pleased with our Westinghouse gas-fired, radiant-tube, roller hearth furnace and the job it is doing to help preserve our quality record.

It has been in continuous operation for over seven months annealing our Nickel Silver and Phosphor Bronze, as well as other non-ferrous alloys. The furnace and your Endogas multiple retort generator combine to give us the operational and safety features we must have.

Very truly yours

ACW LMP

President

Gas-fired or electric, there's a Westinghouse Furnace to meet every heat-treating need. Select from a wide variety of standard units; or special designs can be prepared to meet particular needs. It's your assurance of an unbiased answer to your all-important problem. Westinghouse Electric Corporation, Industrial Heating Division, Meadville, Pennsylvania. J-10370

YOU CAN BE SURE... IF IT'S

**Westinghouse**

**HEAT-TREATING FURNACES**

IF YOUR PRODUCT CALLS FOR HEAT-TREATING . . . IT CALLS FOR A WESTINGHOUSE FURNACE . . . GAS OR ELECTRIC

for economical production use

# Pittsburgh Special Shape Wire

For nut making and special fabricating you will find that Pittsburgh square, hexagonal, octagonal and rectangular wire works smoothly in your machines—makes for efficient economical production. It has the inherent, consistent quality of all Pittsburgh Wire to give you a sound product. For information on how to order write Pittsburgh Steel Company, Dept. WWP, Grant Building, Pittsburgh 30, Pa.

P

**Pittsburgh Wire**

A product of **PITTSBURGH STEEL COMPANY**

*"Charlie—what do you suppose happens to boys who don't use* **Swift's Soaps?"**

Swift's complete line gives you the *right* soap for most wire drawing jobs. Swift's Soaps are uniformly dependable because all are produced to rigid quality specifications. They offer efficient lubrication with minimum dusting.

**Swift's research leads to better soaps**

Swift's technical researchers work constantly to maintain high product quality . . . to develop even better soaps for industry.

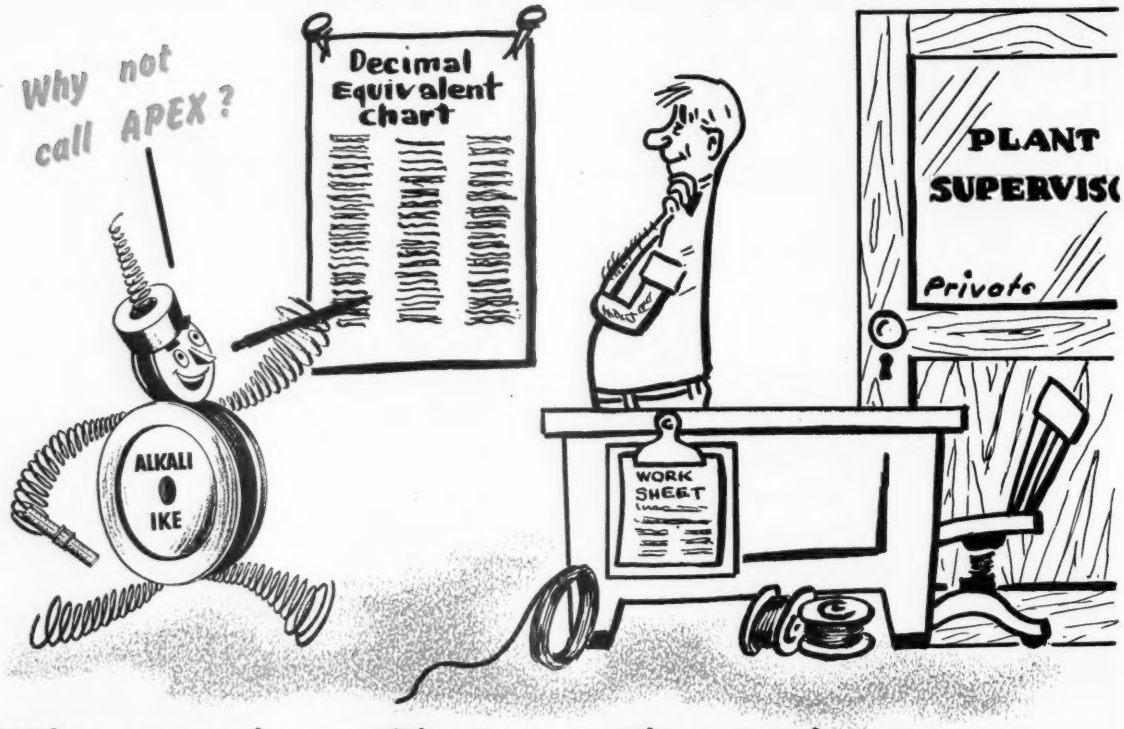
**Swift offers prompt, resourceful delivery**

A Swift distribution point is near you. Strategic locations from coast to coast offer you fast, economical delivery on these and other fine Swift's Soaps:

**Powdered White Ribbon • Guaranteed Powder • Snap Heavy Duty Wire Drawing Powder No. 282 • No. 559 Powdered Soap**

Call **SWIFT** first for **SOAPS**

**SWIFT & COMPANY**
*Soap Department, Chicago 9, Illinois*




# *Why not! Many others have . . . and practical solutions to their wire drawing problems have been the result.*

**WE FEEL our biggest asset is our experience and the familiarity with all problems facing wire men.**

**What better time than at the beginning of our 20th year to tell you that . . . . we strive to justify your faith and feel an accumulation of problems solved (like deeds well done) is the real reason which enables us to grow. We are thus able to build up an organization to continually serve you better.**

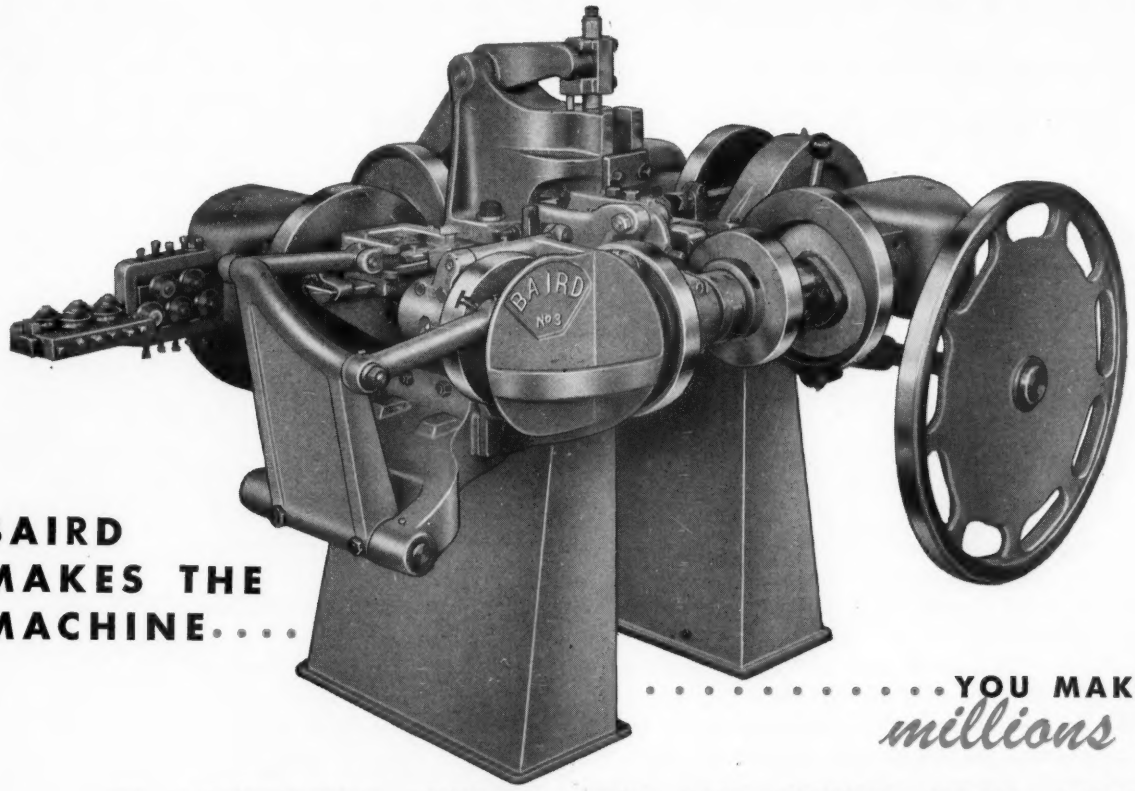
*LET YOUR APEX REPRESENTATIVE DEMONSTRATE THE OPPORTUNITIES FOR INCREASED WIRE DRAWING EFFICIENCY IN YOUR PLANT.*

*Ask to have him call at your convenience.*

**APEX ALKALI PRODUCTS CO.**
OUTSTANDING PRODUCERS OF WET WIRE DRAWING LUBRICANTS
MAIN & RECTOR STREETS, PHILADELPHIA 27, PA.

ASK BAIRD ABOUT IT!

# HIGH PRODUCTION TOOLING




BAIRD MAKES THE MACHINE. . . .

. . . . . YOU MAKE *millions*

## . . . OF ACCURATELY FORMED WIRE AND RIBBON METAL PARTS

The Baird automatic Four-Slide Machine produces an extremely wide variety of articles made of any commercial wire . . . round, half-round, square, or flat . . . at highest speeds. It takes coiled wire from a reel, straightens, feeds, and cuts off the required length . . . then forms and ejects the part produced. Eight sizes handle shorter wire lengths; three sizes take longer lengths to 32½".

By means of special attachments, the versatility of the machine is further extended to include the making of round wire and ribbon metal rings, secondary cut-offs, lettering, and other operations.

The detailed and complete story, with specifications, is told in our new Four-Slide Bulletin. If you require hundreds of thousands or millions of wire units to ½" dia., or flat ribbon metal products to 1½" wide . . . this is your profit-making machine. Send for bulletin.

3BA53

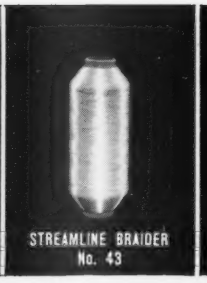
*the* BAIRD MACHINE COMPANY
STRATFORD • CONNECTICUT

AUTOMATIC MACHINE TOOLS • AUTOMATIC WIRE & RIBBON METAL FORMING MACHINES • AUTOMATIC PRESSES • TUMBLING BARRELS

SERVING PACKAGE No. 5023

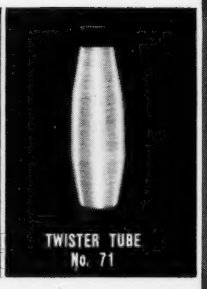
STRAIGHT-EDGE BRAIDER No. 42

SERVING PACKAGE No. 51



STREAMLINE BRAIDER No. 43

SERVING PACKAGE No. 53

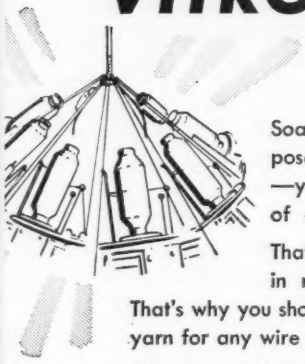


TWISTER TUBE No. 71

# HIGH TENSILE STRENGTH...

## *a valuable feature of*

# VITRON GLASS YARN



Soak it in oil, spray it with water, or expose it to heat, sunlight or corrosive vapor —you won't destroy the tensile strength of a jacket braided with Vitron Yarns.

That's why Vitron Yarns are being used in more and more cables every day. That's why you should consider Vitron when you select a yarn for any wire or cable application.

Great strength of Vitron Yarns starts with production of the basic glass fiber. Glass Fibers Inc. uses its own independent electronic-extrusion process to produce filaments of consistent uniformity. A variety of sizes is produced—450's, 300's, 225's and 150's—and plied into a full range of yarns. Low twist and regular constructions are standard with Vitron.

Glass Fibers Inc. now prepares all types of braider and wire serving packages, designed for various types of braiding and reinforcing machines. *For information and samples write to Glass Fibers Inc., 1810 Madison Ave. Toledo 2, Ohio.*

**YOU'LL LIKE THE VITRON PACKAGE**

- ***uniformity in spacing***
- ***uniformity in tension***
- ***available in standard and low twist***

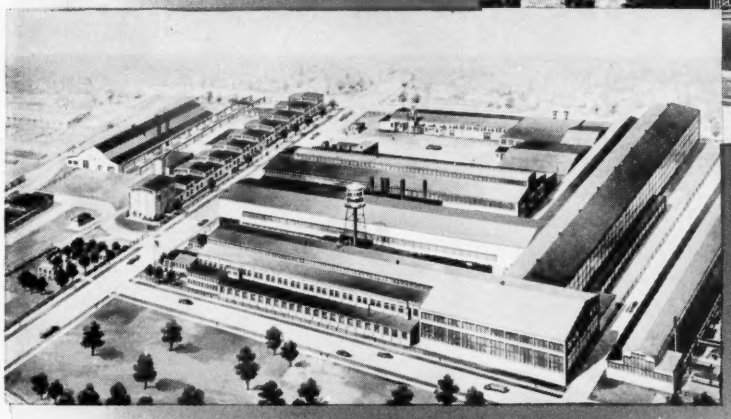
# GLASS FIBERS INC.

*Makers of glass fibers by the ELECTRONIC-EXTRUSION process developed, patented and used exclusively by Glass Fibers Inc.*

VITRON Yarns • Rovings • Micro-Fibers • Pipe Wraps • Industrial Mats • MICROLITE Thermal and Acoustical Insulation
DURAMAT Vapor Barriers • VIBRAGLASS Mounting and Packaging Materials • COUSTIC-AIRE and THERMO-JET Aircraft Insulations.

# *The Right Combination for rubber and plastics equipment, planning and processing*

An experienced Engineering Organization with the "KNOW-HOW" of rubber and plastics process engineering and machine design.



A machinery manufacturing plant with the "KNOW-HOW" resulting from years of experience in building quality equipment.

## *the whole job* from idea to production or any part thereof

This combination of Hale and Kullgren, Inc., and The Aetna-Standard Engineering Company offers a complete service to the rubber and plastics industry. We are equipped to deliver a complete plant, a specialized process, an engineering service or individual machines for processing rubber and plastics. For instance, some of our current projects are—a Phenolic Resin Molding Powder Plant; a Tire Manufacturing Plant; a Process for Manufacturing Plastic Pipe; a Compounding System and Mill Room for Mechanical Rubber Goods Plant.

We also engineer, build and service the famous National Erie line of rubber and plastics processing equipment.

If you need experienced and competent help in processing or manufacturing—call on us.

## *your inquiry*

Whatever your requirements in plastics or rubber equipment or planning, address your inquiry to:
Hale and Kullgren, Inc.,
P. O. Box 1231, Akron, Ohio.
Give us an outline of your needs and we will give you prompt and authentic information.

*National Erie products for the Plastic and Rubber Industries • Extruders • Simplex Doors for Autoclaves • Mills and Hydraulic Presses.*

*• This old and well-known line of machinery was acquired March 1, 1952, by The Aetna-Standard Engineering Company. They are manufactured in their Warren, Ohio and Ellwood City, Pa., plants. The sales and engineering of the National Erie line is the responsibility of Hale and Kullgren, Inc., Akron, Ohio.*

SALES and ENGINEERING by

**HALE AND KULLGREN INCORPORATED**

P. O. BOX 1231 • AKRON, OHIO

MANUFACTURING by

**Aetna-Standard**

THE AETNA-STANDARD ENGINEERING CO
PITTSBURGH, PA.

*Plants In Warren, Ohio*
*Ellwood City, Penna.*

# Three Steps to Success in the WIRE INDUSTRY

## YOUR PRODUCTS FALL INTO ONE OF THESE CATEGORIES.

## *USE "WIRE AND WIRE PRODUCTS" TO SELL WHAT YOU MAKE.*

### RODS and WIRE

There are 143 plants producing bars, billets and rods, most of which also draw wire.

Such concerns can sell their products to others who purchase rods and wire for redrawing and for the fabrication of wire products.

497 concerns draw wire from purchased rods or wire to be re-drawn to smaller gauges.

All concerns who produce ferrous or non-ferrous billets, rods and wire to sell will find a ready market through the advertising pages of WIRE AND WIRE PRODUCTS, the wire industry's one and only paper, serving this field exclusively.

### MACHINERY and EQUIPMENT

Machines wear out and become obsolete. To keep abreast of technical developments, replacements must be made continuously, to say nothing of the demand occasioned by plant expansions.

You can assure your company of first consideration by keeping your customers advised of your products and improvements by consistent advertising in WIRE AND WIRE PRODUCTS.

### SUPPLIES and SERVICES

If you are selling lubricants, coating compounds, inhibitors, dies and the like—or even engineering services—the industry will know where and to whom to turn in time of need if you will keep them informed by advertising these products and services in WIRE AND WIRE PRODUCTS.

**Advertise to build customer acceptance and good-will——and to get orders.**

***Full information on advertising rates and circulation is available upon request. Send for information today.***

**ADVERTISING DEPARTMENT**

# WIRE AND WIRE PRODUCTS

**453 Main Street** -:- **Stamford, Conn.**

# CHASE WIRE can help keep your production costs down

You cut down rejects when you use Chase Brass and Copper Alloy Wire.

Chase mills inspect every coil of wire produced. No scratches, no slivers, spills, or laps! Chase wire is of uniform temper and grain size, uniform in surface texture and color, accurate in gauge. It comes to you clean and bright.

Chase wire is available in a wide variety of alloys, shapes, sizes and tempers.

*Write today for free folder "Chase Cold-Heading Extruded Brass and Copper Alloy Wire."*

Chase BRASS & COPPER

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

*The Nation's Headquarters for Brass & Copper*

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|---|---|---|---|---|
| Albany† | Cleveland | Kansas City, Mo. | New York | San Francisco |
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# PROGRAM

## OF THE TRENTON REGIONAL MEETING OF THE WIRE ASSOCIATION

## APRIL 16 and 17, 1953, STACY-TRENT, TRENTON, N. J.

**THURSDAY, APRIL 16th:**

8:00 A.M.—Registration Desk open from 8:00 A.M. to 6:00 P.M.

12:00 Noon—Board of Directors' Luncheon

1:30 P.M.—Technical Session:

CHAIRMAN

H. F. Jacobsen, Director of Packaging and Loading, American Steel & Wire Div., U. S. Steel Corporation, Cleveland, Ohio.

PAPERS

"Packaging of Wire and Wire Products" by A. H. Andrews, Special Engineer, Bethleham Steel Company, Bethlehem, Pa.

"Mechanical Handling at the Wire Mills of John A. Roebling's Sons Corporation" by John Maisch, Wire Mill Foreman, John A. Roebling's Sons Corp., Roebling, N. J.

6:00 to 7:00 P.M.—Cocktail Party

7:00 P.M.—Banquet at the Stacy-Trent Hotel. The after dinner speaker will be Prof. John Tukevich, Assistant Professor of Chemistry at Princeton University.

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**FRIDAY, APRIL 17th:** **PLANT TOURS**

9:00 A.M.—Busses will leave the hotel for the following inspection tours:

TOUR A: — Ferrous Division—to the Roebling Works of John A. Roebling's Sons Corp., Roebling, N. J.

TOUR B: — Non-Ferrous Division—to the mill of Crescent Insulated Wire and Cable Company, Trenton, N. J. Note: If enough people are interested in visiting the Roebling copper wire mill in the afternoon, a trip there will be arranged to follow the visit to Crescent.

### PLANS FOR THE LADIES

An auxiliary tour for the ladies present is being arranged so that those coming with members and guests may be entertained while the men are attending other functions. Some points of interest will be the British Barracks, the Battle Monument, the Trent House, Pennsbury Manor (William Penn's home) and Washington Crossing Park. Luncheon will be at Bucks County's Bohemian Village in New Hope, Pa.

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FEES: A single charge of $8.50 will cover registration, banquet, luncheon, cocktails and busses for the men.

A single charge of $6.50 will cover the tour, luncheon and the banquet for the ladies.

---

### THE PROGRAM COMMITTEE

C. J. Murray, Jr., Vice Pres., Crescent Wire and Cable Company

R. H. Saviers, Works Met., American Steel & Wire Div., of United States Steel Corp.

L. D. Seymour, Pres., Marshall Richards Machine Co.

R. S. Worth, Manufacturing Mgr., John A. Roebling's Sons Corp.

G. A. Stone, Office Manager, Marshall Richards Machine Co., Inc.

---

**Reservation cards will be mailed to members of The Wire Association. If not a member and you want to attend, write for one to**

## THE WIRE ASSOCIATION

**RICHARD E. BROWN, *Executive Secretary***

**453 MAIN STREET** **STAMFORD, CONN.**

***PLAN NOW TO ATTEND THIS IMPORTANT MEETING!***

# TRAMRAIL-EQUIPPED ROD STORAGE

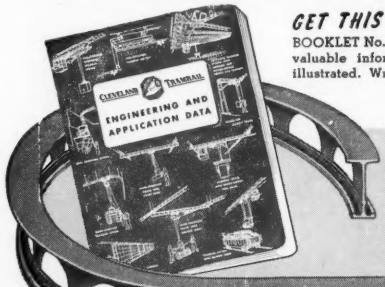
This large structure was especially designed to accommodate a Cleveland Tramrail crane and hairpin-hook. It has enabled an impressive reduction in rod storage and handling costs. Size is 60'-0" x 160'-0". Crane runway is 200'-0" long. Height floor to roof truss is 35'-0". Storage capacity is 2500 tons.

The cost of storing and handling rod has been reduced to a very low figure at the Frost Steel and Wire Co., Ltd., Hamilton, Ont., with an open, roofless building which was built especially for the installation of a Cleveland Tramrail crane with hairpin-hook carrier.

The 160'-0" long structure is provided with unusual cantilever trusses for supporting the three archbeam tracks of the crane runway which extend 20'-0" beyond both ends of the building. These overhangs permit the crane to run over spur tracks of the Canadian Pacific Railroad at one end and the Canadian National Railway at the other end of the frame-work. Thus, rod can be lifted out of railroad cars and placed directly into storage.

On some days 8 cars of rod, or 400 tons, are brought in. The coils are piled eight high. At least double the amount of rod received must be handled, since the crane also has to move it out of storage. The work is taken care of completely by the operator in the crane cab.

The storage areas of many wire and rod plants, both large and small, are equipped with Tramrail systems for either horizontal or vertical coil storage.



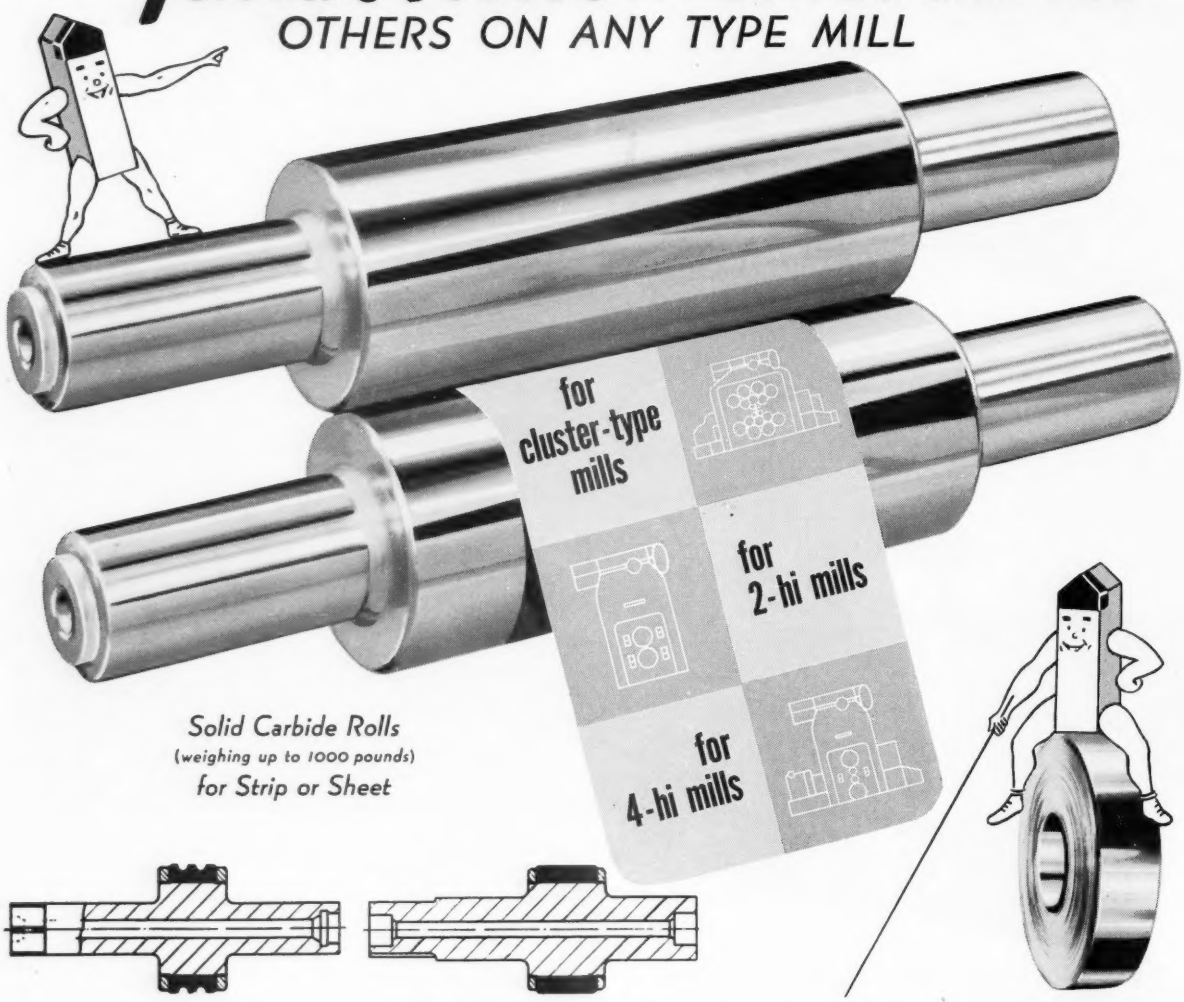

*GET THIS BOOK!*

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

**CLEVELAND TRAMRAIL DIVISION**
THE CLEVELAND CRANE & ENGINEERING CO.
9220 EAST 288th ST. WICKLIFFE, OHIO

**CLEVELAND TRAMRAIL**
**OVERHEAD MATERIALS HANDLING EQUIPMENT**

# Talide Rolls... OUTPERFORM ALL OTHERS ON ANY TYPE MILL




*Solid Carbide Rolls*
*(weighing up to 1000 pounds)*
*for Strip or Sheet*



FOR SHAPE WIRE

SLEEVED ROLLS FOR FLAT WIRE

Solid Talide Carbide Rolls are generally used for cold rolling carbon, alloy, spring, razor, silicon, stainless and other analyses of strip steel. They are being used satisfactorily as either idle or driven rolls. For cold rolling flat or shape wire from round wire, or when rolling metal tinsel or ribbon, a carbide sleeve is usually press fitted to a steel arbor. Talide Rolls can be produced in diameters up to 24" and lengths up to 40".

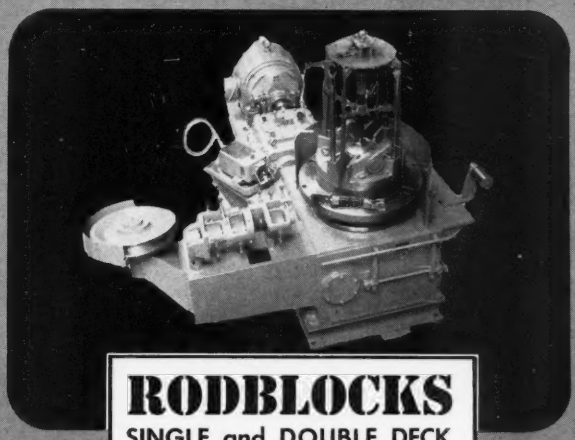
There are actually 14 specific advantages obtained in operation and product by using Talide (Tungsten Carbide) Rolls. Chiefly, Talide Rolls outlast steel rolls from 50 to 1 on low carbon steel to 15 to 1 on high alloys and stainless. You can make greater reductions per pass, operate at higher speeds and impart a smoother, brighter finish. Blanking die life is increased and plating costs reduced. Metal Carbides Corporation, Youngstown 7, Ohio.

*Ask for our*
***Talide Roll***
***Catalog CR-50***

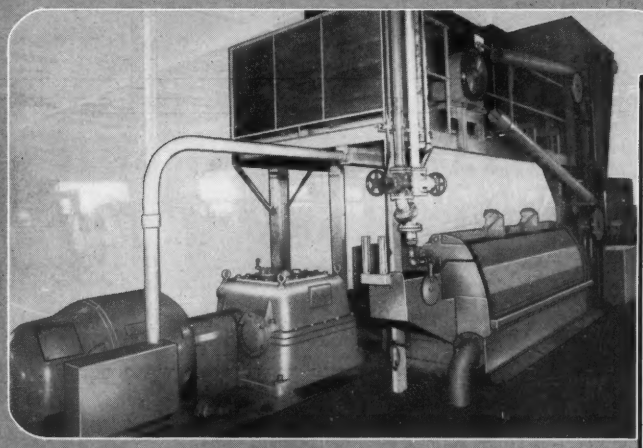
# FIRST in the minds of... PRODUCTION MEN

SYNCRO

**TANDEMS** for HIGH SPEED DRAWING of Copper or Aluminum



**RODBLOCKS** SINGLE and DOUBLE DECK ROD DRAWING and SHAVING



**NON-STOP WIRE DRAWING, ANNEALING** and **CONTINUMATIC** SPOOLING

*Better Machinery for the Wire Industry*

SYNCRO MACHINE COMPANY

PERTH AMBOY • NEW JERSEY • U·S·A

Affiliated Co WINGET SYNCRO, Ltd · Rochester · Kent · England

- STRANDERS
- WIRE DRAWING MACHINES
- WIRE INSULATORS
- PAY-OFFS
- HEAVY DUTY TAKE-UPS
- SPECIAL MACHINERY

# FOR REELS IN CANADA IT'S CANADA REELS LTD.

## 44 YEARS OF REEL-MAKING EXPERIENCE
## THE MOST MODERN REEL PLANT IN CANADA

**You can't beat this combination in obtaining the finest reels in Canada.**

**In addition, all of CANADA REELS' machinery is designed solely for the manufacture of reels. All our lumber, from log to finished product, is cut, sawn, and graded for the purpose of making reels.**

**CANADA REELS' production is devoted entirely to cable reels and packaging accessories.**

**We manufacture wood and wood-metal reels from 12" diameter up.**

**If you are quality and economy conscious—specify reels by CANADA REELS, LTD.**

*Please accept our cordial invitation to visit us at the Mount Royal Hotel during the Montreal Regional Meeting.*

**Canada Reels Ltd.**
**TELEPHONE BURY 67** **BURY, QUEBEC**

# Program

# MONTREAL REGIONAL MEETING

## OF THE WIRE ASSOCIATION, MOUNT ROYAL HOTEL, MONTREAL, CAN., MAY 7-8, 1953

### THURSDAY, MAY 7th:

9:00 A.M.—Registration Desk opens. Wear your badge throughout the meeting.
10:00 A.M.—Busses leave for tour of Canadian Tube & Steel Co. plant.
12 Noon —Busses leave for Montreal East plants.
1:00-2:00 P.M.—Luncheon at Noranda Copper & Brass, Ltd. (Tentative arrangement.)
2:00-4:00 P.M.—Tours of Canada Wire & Cable and Noranda Copper & Brass plants.
4:00 P.M.—Busses leave Montreal East for the hotel, arriving at 5:00 P.M.
7:00 P.M.—Cocktail Hour, followed by banquet at 7:30 P.M., which will be addressed by a prominent member of the Canadian Parliament.

AIRPLANE VIEW OF THE BEAUTIFUL CITY OF MONTREAL

### FRIDAY, MAY 8th:

9:00 A.M.—"Methods and Time Measurement": a discussion provided by Leethen and Simpson, Ltd., Management Consultants, Montreal.
10:30 A.M.—Meeting of Board of Directors; 12:30-1:30 P.M.—Directors' Luncheon.
10:45 A.M.—"History of Insulated Wires in Canada": a paper to be presented by D. S. Grant of Canada Wire and Cable Co., Ltd., Toronto, Can.
2:00 P.M.—Panel discussion "Inhibitors vs. Accelerators," participated in by representatives of prominent manufacturing concerns.
4:00 P.M.—"The Cold Pressure Welding of Wire": a paper and demonstrations by W. A. Barnes, Vice Pres., Eng., Utica Drop Forge & Tool Co., Utica, N. Y.
This paper will be followed by a showing of two motion pictures depicting operations at the Noranda and Steelco plants.
Fees: Registration and Bus Transportation: $5.00; Cocktail Party and Banquet: $6.00.

---

***For the ladies who come to Montreal, a special tour of the city and a cocktail party has been worked out by the Program Committee. Information regarding these arrangements and costs may be secured at the time you register.***

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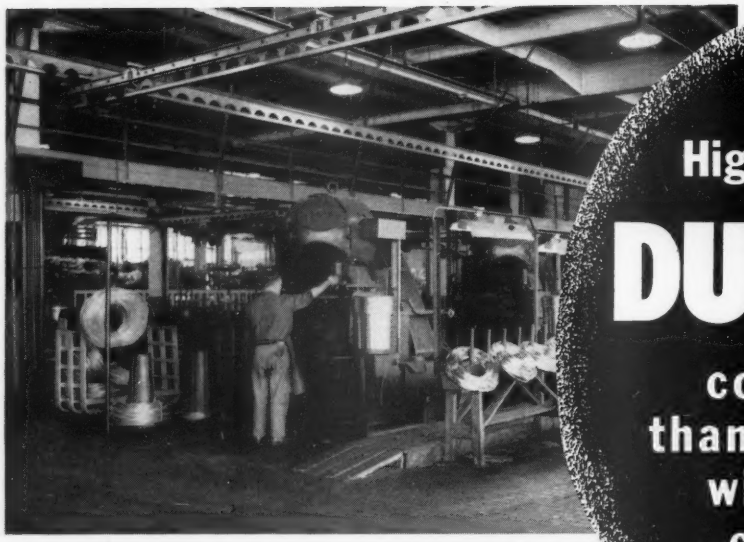

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# The Wire Outlook

The big news last month was the death of the Communist dictator. It is felt by some well-informed observers that Communism without Stalin is bound to slide. Its empire was held together by fear and force. While for a time an appearance of orderly succession may be maintained, internal hatreds, suspicions and ambitions are more likely than not to result in arguments, divisions and strife. Where there is no morality much neutral distrust and a feeling of no security except in being the top-man, fights will probably develop that will destroy the mad monster from within.

Practically all metals, except steel, have now been price de-controlled and the OPS will die a natural death in June. Prices have not reacted sharply. Copper is up, aluminum prices are holding firm and steel prices, when controls are removed, are expected to remain about the same on averages. Wages are likely to go up 5 to 6% through the year, but if the unions continue to make more and more demands there is nothing that can stop another cycle of inflation. Steel wage controls can be re-opened in June and what is done then is expected to set a pattern for other industry groups.

Much of the zip has gone out of the boom, although business activity is expected to remain in high gear at least until the end of the year. In 1954 a mild corrective to the present inflationary tendency may occur. It will not be severe, from present indications, and in the long run should make for a sounder economy.

As certain of the government agencies get their wings clipped, it is bound to affect some manufacturers, who will have to once again look to John Q. Public for business. Building operations will remain high, as an overall picture, with home construction running 13% above last year's levels. Utility and commercial building projects are up, but industrial construction is off. Plant and equipment spending has about reached a peak; it is pointed out, however, that the population growth in the next ten years is going to make a further tremendous expansion in all production facilities necessary, as there will be approximately another 25 million people to feed, house and have their needs catered to by 1960. Such growth, it is estimated, will call for the expenditure of some 200 billions for new plants and equipment.

A new long-range foreign trade policy was worked out in recent weeks, the news of which was somewhat overshadowed by Stalin's death, by which this country will buy more goods abroad and gradually export more. Customs duties are not changed, but much red tape and many regulations have been simplified to facilitate trading. Goods to be imported will be mostly consumer items, while those to be exported are machinery, steel products and farm produce. This new arrangement, it is felt, will have more profound benefits to the free world than Marshall Plan gifts.

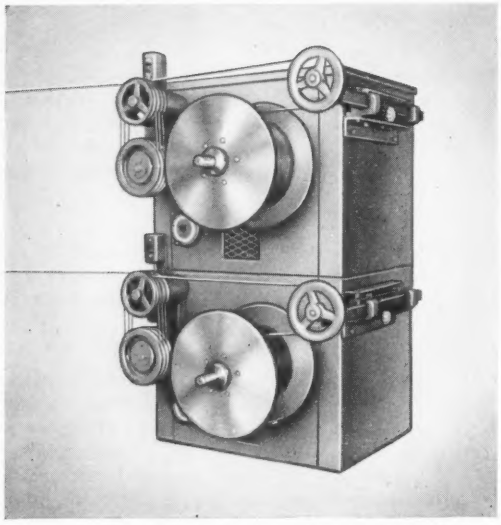
Fine wire is in good demand, with the sellers still in the saddle. For the third quarter, supply and demand should be in good balance. Spring wire, upholstery wire and automotive wire are holding strong. Most wire schedules, however, do not extend beyond June. As we get into the Spring season, the demand for farm fencing and other products for rural consumption is picking up. Farmers in general, with the lower prices for produce, will not be buying as freely, but curtailments in purchases will mostly be limited to new farm mechanical equipment.

Steel production is running at near-need levels, with automobile output being pushed to the limit. Electricity consumption is running about 9% ahead of last year. All this would indicate that business is not doing too badly right now. With a saner and wiser Administration in Washington, it is not too much to expect that in the next two or three years, a really sound basis for our country's industrial and individual prosperity can be laid down.

—from the Editor's Desk

APRIL, 1953

# AUTOMATIC REELER CLASS R



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See Page 395 for a complete listing of JLE Products for the Insulated and Bare Wire Industry

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WIRE AND WIRE PRODUCTS

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Vol. 28 APRIL, 1953 No. 4

# A Note on The Performance of "The Increasing-Load Wire Abrasion Tester"

by F. Levi, Dr. Ing., Chief Engineer

Rola Company (Australia) Pty. Ltd.
Victoria, Australia

**The author, feeling that the article published in September, 1952, leads to incorrect conclusions, has outlined in this commentary on it, his views on correct procedures and evaluations thereof of abrasion testing.**

**In the** September, 1952, issue of "Wire and Wire Products" an article appeared entitled "The Increasing-load Wire Abrasion Tester," in which was described a new type of abrasion tester for vinyl acetal enamelled wires. The abrading action in the proposed tester is performed by a .016" diameter steel needle scraping the enamel, as in the standard repeated scrape abrasion tester described in NEMA Specification MW24-25; but whilst in the standard test the load on the needle is constant for each wire gauge and insulation thickness, in the proposed tester the load increases linearly with the number of strokes.

★ ★ ★

**The** proposed tester is claimed to give increased accuracy and speed of testing, as compared to the standard tester. It is very doubtful whether the first of these claims is justified.

## Meaning of Accuracy

**It seems** advisable, first of all, to explain what is meant by "accuracy."

★ ★ ★

**An abrasion** tester will be considered more accurate than another one when the values of abrasion resistance measured by means of the first tester are more reliable indications of the abrasion resistances of the wire samples tested. This means that if two wire samples having different abrasion resistances are tested, the sample with greater abrasion resistance will give a higher reading in a perfectly accurate tester, no matter how small is the difference of abrasion resistance of the two samples.

★ ★ ★

**It must** be added that "abrasion resistance" means, here, the resistance to a particular abrading equipment; in this case, a loaded steel needle .016" diameter held horizontally at right angles to the wire and moved back and forth along it for a distance of 3/8" at a rate of 60 complete strokes per minute.

## Is Correlation Possible?

**No precise** correlation is possible between abrasion resistance values measured with any one of the various testers which have been proposed from time to time, and the resistance to abrasion of the enamel during winding. Practical winding conditions, in fact, vary too much from one application to another. It can only be said that any one of the approved testers provides some guidance as to the manner in which the wire can safely be handled, as well as a production control method ensuring that the standards of abrasion resistance found satisfactory in practice are maintained.

★ ★ ★

**As an** example, laboratory tests have shown that vinyl acetal enamelled wires give higher abrasion resistance readings than nylon enamelled wires when both are tested with a reciprocating loaded needle, but the reverse happens when the wires are tested with the squirrel cage method. This notwithstanding, we have never found a practical application where one of the two types or insulation was preferable to the other because of better abrasion resistance.

★ ★ ★

**In the** article describing the proposed tester, it is stated that abrasion values determined with the

standard tester show a wide range when different samples of the same wire are tested and that: "It has never been clearly established whether such variations are due to real variations in abrasion resistance or are inherent in the device . . .".

★ ★ ★

**Although** this is correct, there are good reasons to believe that real variations in abrasion resistance are mostly responsible. For instance, some types of enamel similar in toughness to vinyl acetal give a narrower percentage range of abrasion values than vinyl acetal, both being tested with the standard tester. It is understood that the test equipment itself must be rigid, the needles in good condition, the wire without kinks, etc.

## Comparison of The Testers

Let us now examine how the proposed tester appears to give increased accuracy as compared to the standard tester, although it actually does not do so.

★ ★ ★

**Table A** of the article (reproduced here) specifies a starting load on the needle of 150 grams for gauges 16 to 25. The needle load increases linearly with the number of strokes, reaching 750 grams at the 50th stroke. Although it is not stated to which type of insulation addition these loads apply, let us assume that they refer to single enamel, and in particular to 16 gauge Single Formex (SF). The analysis is valid for any wire, but by making this assumption the reasoning can be more specific, and, it is hoped, clearer.

Table A
Operation

| AWG Wire Sizes | Wt. of Slider 1-gms | Added Weight—gms | Total Base Load—gms |
|---|---|---|---|
| 25-16 | 130 | 20 | 150 |
| 15-10 | 130 | 170 | 300 |

★ ★ ★

**In Graph 1,** the ordinates are number of strokes and the abscissae are weights in grams. The scales are: 1"=10 strokes and 1"=100 grams. The straight line FE shows how the needle load varies with the strokes number in the proposed tester. The constant needle load in the standard tester for 16 gauge SF is 550 grams, and this is also shown in the graph. Let us now consider the following hypothetical experiment. Two samples, A and B, of the same wire 16 SF are tested with the standard tester. The abrasion values are 80 and 40, values not uncommonly met in practice.

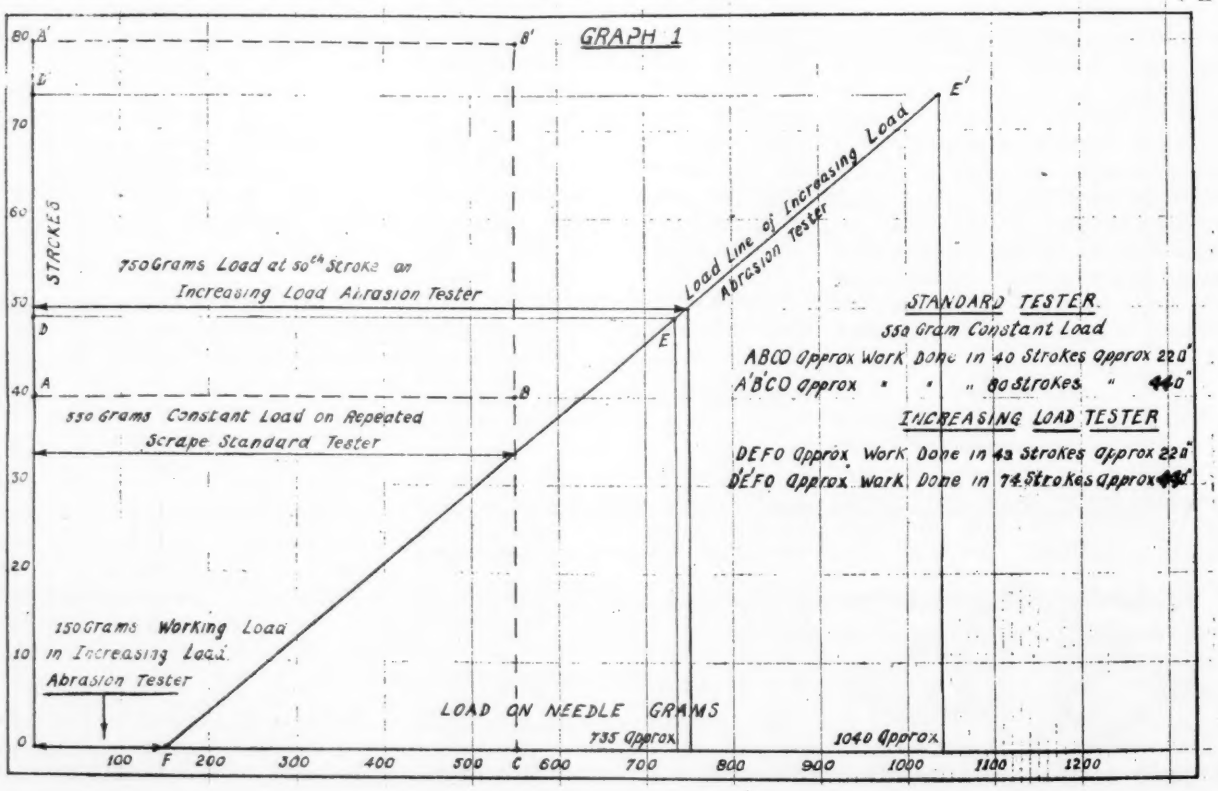
★ ★ ★

**Using** as a measure of uniformity of results the ratio between the two readings, as in the article (page 928) where the ratio between maximum and minimum readings is called "spread ratio", we have:—

$$\text{Spread ratio, standard tester} = \frac{80}{40} = 2.$$

As the weight is contant and only the number of strokes varies, the ratio obtained can be considered a ratio of abrasive work required to penetrate the insulation.

★ ★ ★



**Two more** samples, A' and B', of the same wire are then selected so that their abrasion values, if measured with the standard tester, would again be respectively 80 and 40.

★ ★ ★

**These two** samples, A' and B', are then tested with the proposed tester. As shown in Graph 1, the standard fixed load of 550 grams is not applied to the samples until after the 33rd stroke; this means that the first 33 strokes do much less abrasion than they did in the previous test.

★ ★ ★

**To estimate** roughly how the various works of abrasion compare, let us assume that they are proportional to the product of needle load and number of strokes. The works of abrasion needed to cut through the insulations of samples A and B, tested with the standard tester, are then proportional respectively to the areas ABCO (approx. 22 sq. in.) and A'B'CO (approx. 44 sq. in.) of Graph 1.

★ ★ ★

**With the** proposed tester, similar works of abrasion correspond to the areas DEFO (approx. 22 sq. in.) and D'E'FO (approx. 44 sq. in.). Accordingly, it would require respectively 49 and 74 strokes to abrade through samples A' and B'. The spread ratio would be:

$$\text{Spread ratio, proposed tester (number of strokes)} = \frac{74}{49} \simeq 1.5.$$

Actually, a further artifical reduction of the spread is introduced in the proposed tester by using as a measure of abrasion resistance the weight corresponding to the break through point, instead of the number of strokes. Since the starting weight is not zero, a fixed amount is added to both readings—in this case, 150 grams.

★ ★ ★

**For the** example just described, the weights would be approximately 735 grams and 1040 grams (see Graph 1), giving a spread ratio of:

$$\text{Spread ratio, proposed tester (weights)} = \frac{1040}{735} \simeq 1.4.$$

★ ★ ★

**Numerous** tests done in our laboratory show that the work of abrasion per stroke increases more rapidly with increased needle load than has been assumed here. This fact reduces still further the spread of values obtained with the proposed tester.

★ ★ ★

**The purpose** of this note is to point out that the **nature** of the abrading action is not altered in the proposed tester. Even though the measured values of abrasion resistance differ less from one another, the differences of abrasive works needed to break through the insulation are as great as with the standard tester.

★ ★ ★

**Whilst the** rapidity with which tests can be made with the proposed tester is a definite advantage, a large number of samples may still have to be tested before reaching conclusions regarding the quality of a wire being inspected. With the standard tester, a large spread of measured values makes this need clearly obvious; with the proposed tester, the compression of the values range might cloud the real position. Also, the non-linear relationship between values measured in the proposed tester and works of abrasion complicates the statistical analysis of results.

## Appendix

**The** performance of the Increasing-Load Wire Abrasion Tester and of the Standard Repeated Scrape Abrasion Tester could be compared mathematically if the relationship between the abrasive works done in one stroke at a given needle load and the needle loads were known. This relationship would be extremely laborious to determine, and a simpler approach appears adequate to give an approximate solution of the problem.

★ ★ ★

**It is** fairly easy to determine the approximate relationship between needle loads and numbers of strokes required to break through a given insulation thickness at a fixed needle load. If it is next assumed that each stroke, at a given needle load, does the same amount of abrasive work, the two testers can be compared rather simply.

★ ★ ★

**Numerous** tests performed in our laboratory indicate that the following relationship is roughly satisfied, at least for needle loads not greatly different from those specified in the NEMA Standard MW24-25:

$$N = \frac{K}{w^a} \qquad (1)$$

where:

w = needle load.

N = number of strokes at constant needle load, w, necessary to break through a given insulation.

a = a coefficient which is about 3.5 for the wires tested.

K = total work of abrasion required to break through the insulation. This work varies, of course, for each gauge of wire, enamel type and addition, and baking conditions.

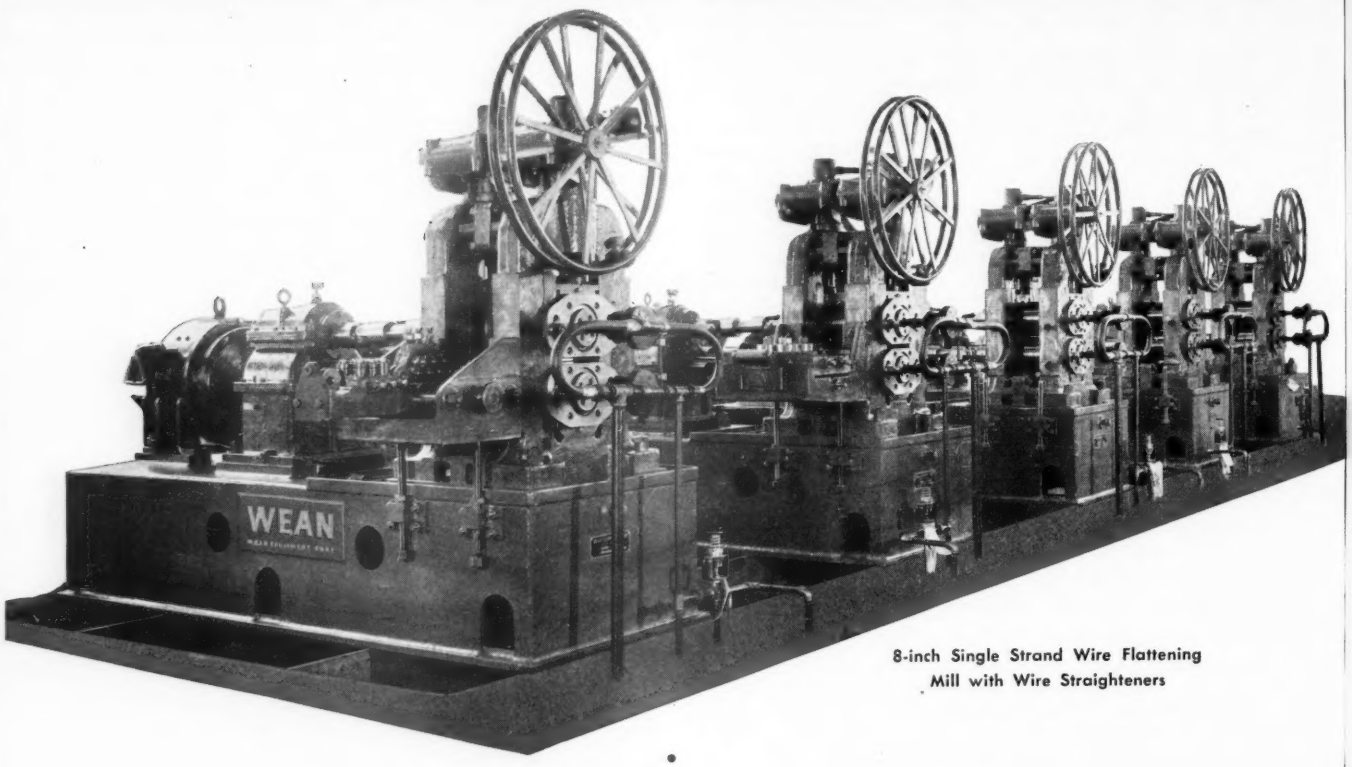
★ ★ ★

**During** the experimental work done to arrive at equation (1), it has been noted that for each gauge of wire and insulation addition there is a minimum needle load which must be exceeded to give reasonably consistent results. For 16 gauge HF, this load is about 300 grams and for 27 gauge HF about 200 grams. At and below this critical needle load, the needle often appears to just slide across the insulation without doing any abrasion for a large number of strokes. Other times, the needle seems to start abrading reasonably quickly; this might be due to small local weaknesses of the enamel coat or to a small roughness in the needle. For 16 gauge HF and needle load of 300 grams, we once recorded up to 12,000 strokes before the insulation was broken through. Since the starting load in the proposed tester is 150 grams for gauges 16 to 25, it is quite possible that practically no abrasion is done for the first ten strokes or so; but this fact will be neglected to avoid complicating the analysis. Using equation (1), the performance of the proposed tester can be represented as follows:—

Abrasive work dk done in ele-

(Please turn to page 419)

# Wean

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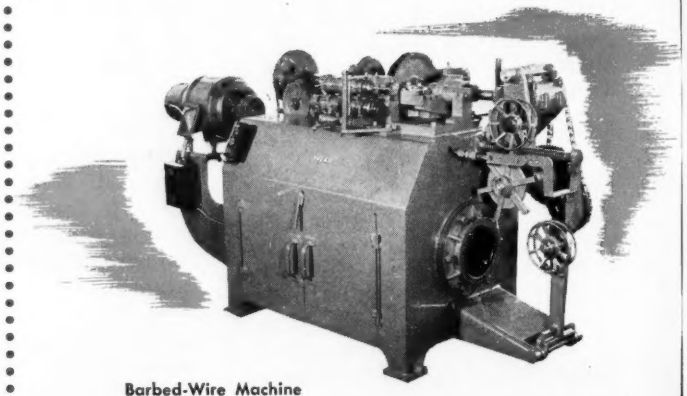
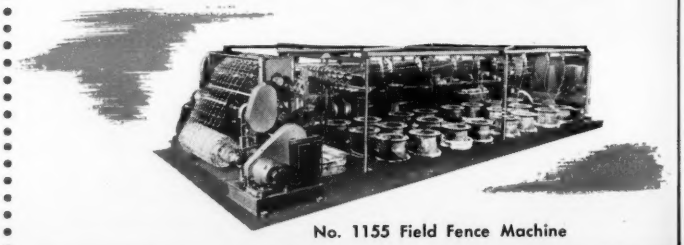


Barbed-Wire Machine



No. 1155 Field Fence Machine

**Wean Equipment Corporation**

# The Woodscrew and its Manufacture

by Karl Rennen, VDI

**In this article which appeared in the July, 1952, issue of Draht, a magazine published in Coburg, Germany, and which is re-printed here by permission, the author traces the development of woodscrew manufacturing procedures and then describes modern production methods. Where in the original article metric measurements have been used, these have been converted to inches and pounds.**

**Up to** the end of the 18th century woodscrews were usually manufactured by hand. The production method was simple: The bolt, very similar to a countersunk shoe-nail, was made by a nail-smith; the head, shaft point and thread were hand filed and the slot was cut with a hand-saw. All this work was at that period mostly carried out in the homes of the workers, as, according to Chamberlain*, woodscrew production remained a home industry until about 1800. The introduction of the earliest machine tools made it possible to produce woodscrews by factory methods, but the manufacturing processes were still very primitive. The forged blank was located in foot operated two-jaw tongues and the shaft and head was then smoothed with a file. A similar holding device was used for cutting the thread; the cutting tool was pressed by hand against the rotating blank, and guided along the shaft so often, until the thread was sufficiently deep. The screws, manufactured in this way, did not have a gimlet point and the thread was too "square."

★ ★ ★

**Between** 1840 and 1850 great efforts were made to invent automatic machines for the manufacture of screws with gimlet point. Apparently the method of the three operations was evolved at this time. The method is still in general use to-day, as the basic principle of the modern machine shop is unchanged from these old pioneer machines. Present day higher efficiency is only the result of better materials, higher cutting speeds, etc. but the types of machine, the presses, facing and screwing machines remain as invented by the American Thomas S. Sloan in his time.

* "Timmins, Birmingham and the Midlands Hardware District" Article by Joseph Chamberlain (1866). "Manufacture of Iron Wood Screws."

**In** accordance with the respective final use, woodscrews are made from iron, brass and light metals. The stock used is wire of Siemens-Martin or Bessemer quality, bright or semi soft drawn, in accordance with DIN 177 (German Standard); brass of quality Ms63 and aluminium of the AL-CU-Mg-Alloy; also rolled wire St 38.13 for the manufacture of coach screws the manufacturing method for these will not be discussed in the following text, as it deviates from the production process for bright woodscrews.

★ ★ ★

**Generally** bright woodscrews are produced with

| | |
|---|---|
| Countersunk head | (DIN 97) |
| Raised head | (DIN 95) |
| Round head | (DIN 96) |

with diameters from .0507″ to .390″ and lengths from .195″ to 5.07″.

## COLD HEADING

**Because** of relatively low head volume to be formed, the noncutting forming of the blanks is carried out on single blow cold headers. The machines used for this are of the closed die and also split-die types, the latter are preferred because they are more economical and easier to operate. The split-die machines can produce the longer shaft lengths which are often demanded for wood screws. When upsetting especially short shafts, the split die machine presses in double lengths, whereby the die accommodates 2 pieces of wire, of which the projecting one is headed.

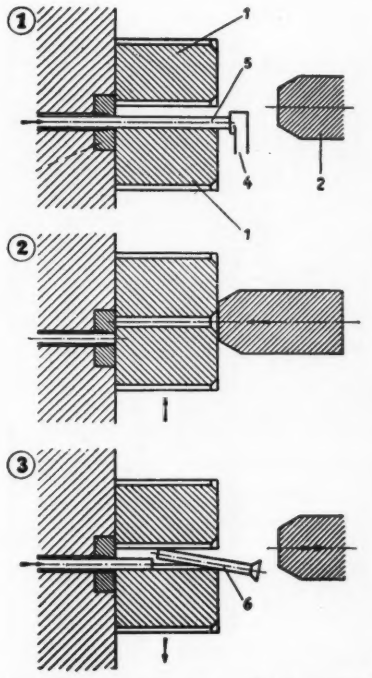



Fig. 1—Working method of split die operated single blow cold header; 1—die segment; 2—punch; 3—shearing bush; 4—swinging stop; 5—material; 6—finished headed blank. * * * *

**Figure** 1 illustrates the work cycle of a single blow split die cold header. Because of the action of the die segments a slight burr below the bolt head is unavoidable. This is eliminated by stock removing machining of the head as will be described later. Closed die operated cold headers have been more frequently employed for woodscrew production in recent years, as these machines are better suited for the production of short screws and enable forming without burrs.

## MACHINING OF THE HEAD

**Bright** woodscrews, especially those with countersunk heads, are demanded with a mirror finish

head face. A stock removing machining operation is therefore unavoidable. This is not necessary for round head and raised head screws, as their head surface on account of the bulged shape satisfies all requirements with regard to smoothness. Such screwblanks are mostly only slotted on slotting machines.

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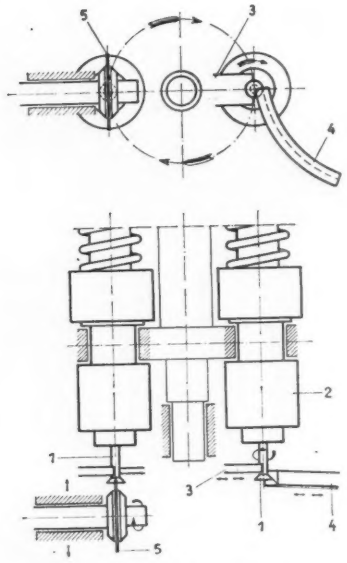


Fig. 2—Working method of head turning and slotting machine; 1—screw blank; 2—collet; 3—steady; 4—form tool; 5—slitting saw. * * *

**The** stock removing machining of the head is carried out on combined head turning and slotting machines, the working method of which is diagrammatically illustrated in fig. 2. The machine works with two identical collet chucks (2) which are supported in an indexing frame. The blank (1) is located in the rotating collet and machined on all sides of the head by a form tool (4). After indexing of the frame, the rotating collet is stopped immediately and the turned blank is slotted by the slot milling cutter (5). A further indexing motion returns the collet to its original position and the burrs are removed by the same form tool. Then the finished part is ejected and the next blank loaded in continuation of the described work-cycle. By arranging two workheads, two screw blanks are machined simultaneously. The machines are arranged in large groups and work fully automatically.

## SCREW CUTTING

**Great** accuracy, which is a necessity for machine screws in order to mate the screws and nuts, is of no importance to wood screw threads. As the woodscrew is intended to be screwed into wood, great care should be taken to obtain a good gimlet pointed thread, a clean cut thread and a smooth thread bottom. The usual method is to cut the wood screw thread on an automatic. The working method on an automatic screw machine is diagrammatically illustrated in figure 3. The turned and slotted screw blank (1) is inserted head first into the fast rotating two jaw collet and then pointed at the shaft end. As soon as the pointing tool returns, the screw cutting tool comes into operation. The cutting edge of this has the same form as the thread and it produces the desired thread depth in several cuts.

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**The** tool holder is guided by a slide which conforms with the threadform and enables the tool to cut a tapered thread right up to the shaft point.

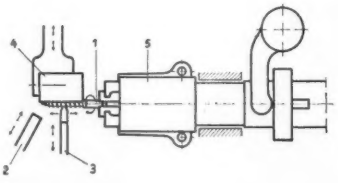


Fig. 3—Working method of thread cutting machine; 1—screw blank; 2—pointing tool; 3—screw cutting tool; 4—steady; 5—collet. * * *

## THREAD HOBBING

**The** hobbing of woodscrew threads was first introduced in the United States in 1891. This method is often used at the present time also in Germany. The principle of thread hobbing is shown in figure 4. When using the hobbing method no previous pointing of the screw shaft is required; the cylindrical thread hobbing cutter produces the thread with its cutting edge in one generating motion, the screw shaft rotating "into" the hob.

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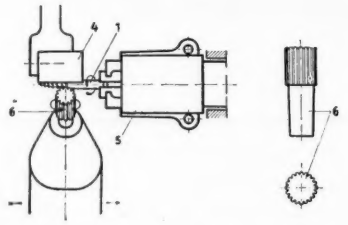


Fig. 4—Working method of thread milling machine; 1—screw blank; 4—steady; 5—collet; 6—thread milling cutter. * * * *

**Contrary** to thread cutting with single point tools, the hobbing process starts at the pointed end of the shaft. The feed movement of the milling head is controlled by a guide bar which reproduces the tapered form of the finished screw.

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**With** regard to the quality of the finished part and economical production, there is no difference between the two screw production methods. The screw cut woodscrew thread runs off to a concentric gimlet point, whilst the generated thread is formed to a slightly eccentric, sharp edged corkscrew point. The machines for both processes are arranged in groups and are fully automatic.

## NON-CUTTING THREAD PRODUCTION

**The** patent, which originated in the United States, relating to the rolling of wood screws threads was taken up by German manufacturers in the 1880s. But screws of this type are not in competition with cut screws. Even to-day the cold-rolling of wood screw threads is not often applied, as with this process the threads and especially the conical shaft points are not as distinct (sharp edged) as required.

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**A** satisfactory thread is produced with thread swaging. During the last few years fully automatic machines have been developed for this purpose, which work roughly on the same principle as those cold swaging ma-

chines* used for the tapering and pointing of wire ends.

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**The** thread swaging machine carries out two operations: pointing and swaging. The working method is as follows: A non-rotating, sliding collet admits the blank and carries it into a die head which machines the thread point. A second collet carries the pointed blank between the swaging dies of the thread swaging mechanism, the working surfaces of which have the thread profile and, controlled by a ring of rollers, hammer the thread into the shaft, at the same time elongating the screw owing to the displacement of metal. The saving of material is considerable. It amounts to about 20—25% and is most favourable with larger diameter screws. When producing woodscrews, for instance dimensioned 6x60, the output of the machine is approximately 40 pieces per minute. Six to seven machines of this type can be run by one operator.

## THE MANUFACTURE OF WOODSCREWS ON PRECISION AUTOMATICS

**Small** and short precision wood screws, especially those used in the manufacture of instruments, are turned from the solid wire on special automatic lathes. The material used is free cutting mild steel in bars. The automatics produce the screws in one operational cycle. They turn the shaft and head, slot the head and mill the thread with greatest accuracy. The spindle speed is approximately 5600 r.p.m. For the manufacture of mild steel wood screws of diameters from .0507″ to .0819″ and .195″ length the output of such an automatic is about 22 pieces per minute. This can be increased by 120% when the raw material is brass.

## INTERMEDIATE TREATMENT

**As** woodscrews are required to be bright polished, the product, after each operation, is placed with an addition of beech wood saw dust into a rotating polishing drum to obtain the desired finish. For the polishing of pressed blanks it is usual to employ horizontally mounted hexagon or cylindrical drums, as these can accommodate a large number of components. The blanks are not only cleaned from drawing fat and oil but the impact of this compact mass removes to a large extent any burrs left from the heading operation. The polishing of semi-finished or finished goods is carried out in a quick operation in tilting polishing bells. As an example, take a continuous polishing plant with an hourly output of approximately 6500 lbs. of screws. In the upper part of this plant 12 polishing bells in a circle are so arranged, that after always the same length of time the loading resp. discharging takes place. Each time the required amount of sawdust is automatically added and removed by suction. Simultaneous with the emptying of a polishing bell, the net weighing and inspection of the screws is carried out.

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**In** connection with this plant the cleaning of the emptied transport containers is carried out. These are taken by chain belt through a washing chamber, spray rinsed and hot air dried and returned to be loaded again with bright polished screws.

## THE PACKING OF THE FINISHED SCREWS

**Unless** otherwise requested by the customer, the woodscrews are packed into boxes in units of 1 gross. Usually the weighing and boxing of medium and large diameter screws is carried out by hand, but the weighing of the smaller kinds is done on weighing and packing machines. These machines work with electrical units and weigh or count automatically with an unvarying accuracy of 0.5—1%. The output varies with the size of automatic, in accordance with the weight, between 350 and 700 gross per hour.

* E. Ribback, Kalthaemmern, Werkstatt-Technik und Maschinenbau H 6 (1950) S. 224/25.


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|---|---|---|---|
| 2½" | 3" - 3¼" - 3½" | 1¾" | .628 to .633 |
| 3" | 3" - 3¼" - 3½" | 1¾" | .628 to .633 |
| 3" | 3" - 3¼" - 3½" | 2" | .628 to .633 |

**ACROMETAL PRODUCTS INC.**

Division U. S. Bobbin and Shuttle Co., 616 Fifth Street N., Minneapolis 1, Minn.

# Signal Corps Develops New Lightweight Carrier Cable

**This report on a new type of carrier wire is published through the courtesy of the Bakelite Company, whose insulating materials were used by the Signal Corps in the research and development work that led to the successful design of the "Spiral-4" cable described herein.**

**A new** type of carrier cable developed by the U. S. Army Signal Corps has ten times the impact resistance, five times the frequency range, weighs about one-third less yet costs about one-third less than a corresponding type used in World War II. Insulation made of polyethylene and outer jacketing made of a new Vinylite plastic make possible these radical improvements in the new multi-channel carrier communications cable, known as Spiral-4 cable.

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**Completely** redesigned by engineers at the Coles Signal Laboratory, Fort Monmouth, New Jersey, with the aid of these materials, new Spiral-4 cable has greater stability of electrical characteristics, does not vary appreciably with flexure and use, and effectively minimizes crosstalk and induction noise. Because of polyethylene insulation and Vinylite plastic jacket, this new cable performs satisfactorily over a wider temperature range, resisting moisture and corrosion in high-humidity tropic regions or sub-zero cold in the Arctic.

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**The new** Spiral-4 cable will eventually replace all the old carrier cable for armed force tactical usage. This versatile, lightweight cable can be used both in forward combat areas as a 4-channel system and then, later, as a rear-echelon telephone network operating with 12 frequency channels. As many as twelve two-way conversations at one time are carried by the cable's four slender copper conductors, each on a different frequency band in the range up to 60 kilocycles.

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**Years of** research by Bakelite Company's laboratories have gone into perfecting a Vinylite plastic for jacketing wire and cable capable of withstanding extremes of heat, cold, pressure, flexing, abrasion and chemical corrosion. This new compound, marketed as Vinylite plastic QG-5924, supplies an almost universal answer for jacketing. Maximum operating range for this Vinylite plastic extends from 140 degrees down to minus 67 degrees F. Half-inch cable jacketed with this compound will meet a two-inch diameter cold bend test at

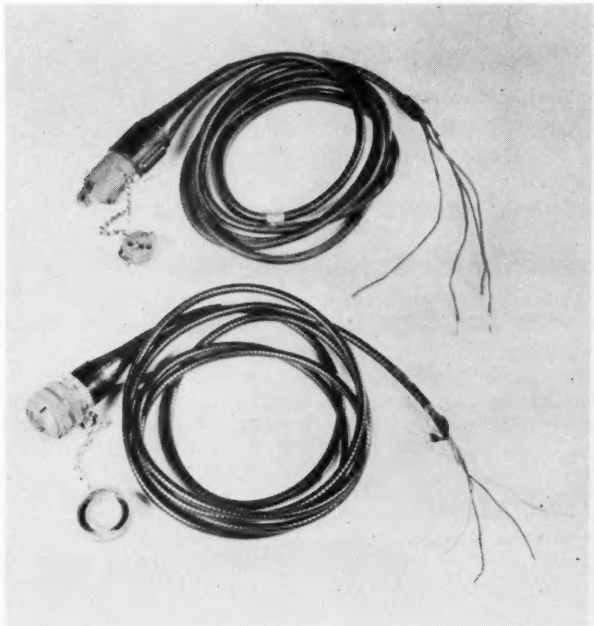

**Figure 1—Spiral—4 cable showing 4 copper conductors and 3 steel strands and insulation construction.** * * * * * * * * *

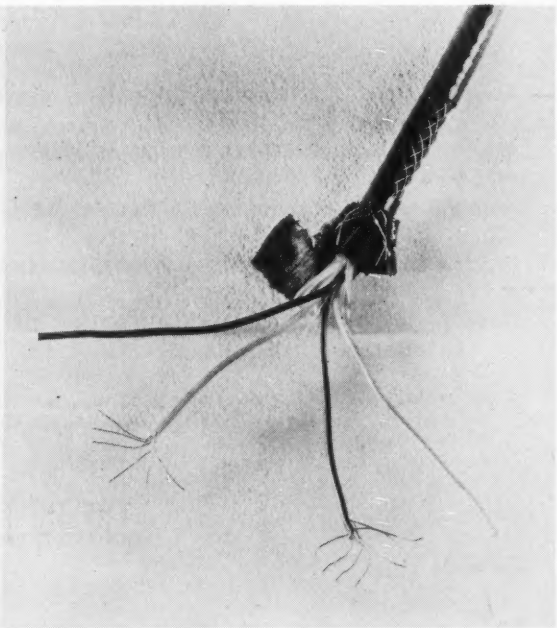

**Figure 2—New Spiral—4 polyethylene covered cable that saves weight, has great strength and extreme chemical inertness.** * * * *

minus 67 degrees F. The new compound maintains excellent abrasion resistance, hardness, toughness and deformation resistance throughout this wide range of temperature. Because of this outstanding ability to take harsh treatment, Vinylite plastic QG-5924 was accepted as a jacketing material for Spiral-4 cable.

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**The** superior dielectric properties and a-c resistivity of Bakelite polyethylene make it an excellent insulating material. Combining these features with strength and light weight, polyethylene permits a reduction in the weight of Spiral-4 cable and the amount of copper used, and consequently cut the cost of manufacture from $850 which the old cable would cost today, to $600 per mile. Extrudable over wire to close tolerances of plus or minus .003 inch, the polyethylene insulation also minimizes electrical unbalances that cause electromagnetic and electrostatic induction noise in the transmitted message.

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**From** the center out, new Spiral-4 cable consists of: (1) Four conductors of seven-strand copper wire, (2) each covered by extruded polyethylene insulation, then wound in a spiral and held firmly together in a star quad configuration by (3) a belt of extruded polyethylene. Over the belt, (4) carbon-impregnated textile tape is wrapped for electrostatic stabilization followed by (5) stainless steel braid to furnish high tensile strength and yet avoid build-up of electrical losses at 60 kilocycles. Extruded over the steel braid (6) is the jacket of Vinylite plastic QG-5924. Constructed in this manner, new Spiral-4 cable weighs 370 pounds per mile as against 570 pounds per mile for the old type it supersedes. Cable diameter has been reduced from .43 inches to .36 inches for new Spiral-4. And the frequency range now includes 12 channels going up to 60 kilocycles, where formerly there were only four channels between 0 and 12 kilocycles. An added feature of the new Spiral-4 is a separate supervisory voice frequency between 0 and 4 kilocycles used only for maintenance but which remains operative even if the power circuit fails or equipment is out. The old cable furnished no such supervisory circuit.

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**The** polyethylene belt surrounding and completely filling in the space around the four conductors maintains the spiralled wires in a stable configuration even when flexed or subjected to crushing weights, thus stabilizing electrical unbalances from side-to-side or side-to-ground, and maintaining electrical characteristics at a fixed, non-varying value.

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**Both** the new Vinylite plastic and polyethylene are inert to most chemical action and resist moisture and corrosion over a wide range of temperature. Geophysical cables with extreme low temperature performance are being produced with a jacketing of this Vinylite plastic. Polyethylene insulation makes possible the manufacture of cable with extremely low attenuation over a wide temperature and frequency span.

## CALENDAR OF COMING EVENTS

***April 16 and 17*—TRENTON REGIONAL MEETING at the Stacy-Trent Hotel, Trenton, N. J.**

***May 7 and 8*—MONTREAL REGIONAL MEETING at the Mount Royal Hotel, Montreal, Can.**

***June (date to be announced)*—PACIFIC COAST REGIONAL MEETING, San Francisco, Cal.**

***Sept. (date to be announced)*—NON-FERROUS DIVISION MEETING, Waterbury, Conn.**

***Nov. 9 - 12*—THE ANNUAL CONVENTION OF THE WIRE ASSOCIATION, with headquarters at the LaSalle Hotel, Chicago, Ill.**

All of these meetings will be publicized in Wire and Wire Products and complete programs published well in advance of the meetings. Members of The Wire Association will also be circularized by mail and hotel reservation cards, where needed, will be enclosed.

**THE WIRE ASSOCIATION**
RICHARD E. BROWN, Executive Secretary

453 MAIN STREET STAMFORD, CONN.

*Announcing the . . .*

# PACIFIC COAST REGIONAL MEETING

## of

## THE WIRE ASSOCIATION

### June 12, 1953, Sir Francis Drake Hotel, San Francisco, Cal.

### THE PROGRAM

The Registration desk will open at 9:00 A.M. and be open all day.

A plant inspection trip will be made in the morning to the wire rope mill of the Columbia Steel Division of The United States Steel Corporation at Pittsburg, Cal. Luncheon will be served at the plant with the compliments of the company.

Dinner starts at 7:30 P.M. and will be followed at 8:30 P.M. by the Technical Session, at which two papers will be presented. The titles and names of the speakers will be announced at a later date.

### FEES

A registration fee of $6.00 will be charged, which includes the cost of the dinner. For the plant inspection trip there will be a charge of $2.00 per person to cover bus transportation.

### PROGRAM COMMITTEE

Joseph N. Kemple, Manager of Wire Rope and Electrical Wire Sales, Columbia-Geneva Steel Div., United States Steel Corp., Russ Building, San Francisco, is serving as Chairman.

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**THIS IS THE TIME TO MAKE YOUR PLANS TO ATTEND THIS MEETING. IT WILL BE INTERESTING AND WORTH YOUR WHILE. FURTHER DETAILS WILL BE ANNOUNCED LATER.**

## THE WIRE ASSOCIATION

**RICHARD E. BROWN, *Executive Secretary***

**453 MAIN STREET** **STAMFORD, CONN.**

# Moisture Resistance of Insulated Conductors —A General Review

by R. C. Graham, Chief Engineer

Rome Cable Corporation

Rome, New York

**This paper, presented by the author at the Signal Corps Symposium in Asbury Park, N. J., last December, describes the quantities that cable coatings must have where other than lead sheaths are used, in order to provide proper moisture resistance to the conductor wires.**

## Introduction

**Any cable** design which incorporates a continuous metallic covering, such as a lead sheath, automatically provides complete moisture protection to the underlying insulation, except, of course, when a discontinuity or rupture inadvertently appears in the sheath. However, the addition of a metallic sheath is not always advisable or practicable since such hazards as added weight, electrolysis, corrosion, vibration and economic factors may eliminate its usefulness as a cable covering. This seems to be more the rule than the exception and in most of these cases the ability of conductor insulations and non-metallic coverings to withstand water or moisture can well become a major concern.

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**This means** that a somewhat thorough knowledge of the possible effects of moisture is needed and, in this connection, such subjects as the theories or mechanics of moisture attack, methods of test, evaluation of insulating materials and coverings, effects of environmental conditions, etc., must all be considered. It will be the object of this paper to briefly review and summarize these subjects, particularly insofar as communication and signal wires are concerned, since the effect of water on these applications could lead to inoperative circuits due to either a prohibitive increase in attenuation constants, a serious change in impedance values, an appreciable reduction in insulation resistivity, or even an ultimate mechanical failure of the cable insulation.

## History

**The need** for flexible and moisture-resistant insulation was first met by submarine telegraph cable some forty years before its use for power cable in this country. It is interesting to note that Faraday used gutta percha insulation in his experiments about one hundred and twenty years ago. With the development of communication on the continent of Europe the first submarine cables across the English Channel, made in 1850, were insulated with gutta percha which is still commonly used for submarine communication cables. It was not until 1870 that rubber was used for this job. Rubber was used only in shallow water or at shore ends where exposed to air, since these cables were non-leaded. Because gutta percha softens and oxidizes readily, it is unsuited for such service. The peculiar problem of moisture resistance was therefore met and recognized at an early stage of communication cable development. Gutta percha has excellent stability of electrical properties when wet, but perishes when allowed to become dry. Vulcanized rubber had good mechanical properties, resistance to temperatures of tropical water in that it did not soften, could be exposed to air and was relatively resistant to oxidation. However, its electrical properties in water were relatively unstable. At shore ends where the properties of gutta percha were least satisfactory, replacement was less of a problem and therefore rubber was an excellent supplement.

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**The** United States Coast Guard has used non-metallic sheathed rubber insulated Communication Cable for many years with reasonable success. Of course there is little voltage stress on such cable. Erratic behavior of cables with presumably the same insulating compound led to the demand for a means to evaluate the moisture resistance of insulation for such cables, and also the development of a low dielectric constant rubber insulation suitable for submarine telephone application. Through the co-operation of the Coast Guard, Bureau of Standards and cable manufacturers, studies were carried to a successful conclusion and in the mid 1920's a specification was developed. This specification included a gravimetric test for water absorbed and a test for change in dielectric constant at 1000 cycles after a few weeks water immersion at 70°C. It was designed to select a high rubber content insulation suitable for communication service and with few modifications this test is still used today.

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**In the** late 20's there began a trend away from the use of lead sheaths for power cable. This for the first time placed an emphasis on the importance of moisture resistance of rubber insulations for power use.

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**Except** for the Coast Guard and similar investigations it was almost impossible to predict the performance of the many insulating materials then available without actually utilizing them in service. While this method of analysis necessarily involved an almost pro-

hibitive length of time, it did show that:

**(1) Long-time unaccelerated electrical immersion tests in the laboratory paralleled the long-time performance properties of these materials.**

**(2) The ability of an insulation to operate successfully over long periods in wet locations was directly related to the *stability* of its electrical characteristics for the same periods and under the same conditions in the laboratory.**

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**Subsequent** experience has proved this reasoning to be correct, whether applied to communication or power cables and regardless of the type of insulation involved. At present, by proper selection, compounding and processing of the various thermosetting and thermoplastic materials available today, cable insulations having most satisfactory moisture-resisting properties can be furnished. In fact, the remarkably successful performance of most of the non-metallic sheathed power cables used underground and under water are dependent almost wholly upon the ability of the cable insulation to maintain its initial physical and electrical properties for long periods in the presence of water.

## Theories

**The** mechanics of water absorption have been comprehensively investigated but there seems to be a lack of agreement when these ideas are interpreted in terms of actual operation. It is generally agreed that there are at least two physical methods by which water might affect insulation: the first being by actual "absorption," and the second by the so-called term "diffusion." We visualize "absorption" as a direct layer effect where the successive outer layers of the insulation exposed to the water might gradually become water-soaked. This would be reflected by tests for increase in weight or the increased electrostatic capacitance of the dielectric. The second phenomenon, "diffusion," is more complex, for here we are involved with additional parameters such as pressure and rate where moisture might permeate the insulation as a "membrane" and establish possible irregular conducting paths of water from the conductor to the outer surface of the insulation. A weight test would not disclose such a condition but it is believed that some sensitive electrical quantity such as insulation power-factor or resistivity might be related to diffusion.

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**The** effect of moisture upon cable characteristics can probably be best explained in terms of its electrical action, since here we have a direct determination of the effect of moisture. The insulating properties of a dielectric are adversely affected by the conducting properties of the water.

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**The** equivalent electrical circuit of a cable dielectric is merely the parallel circuit for an imperfect condenser. Now, under an alternating stress, the familiar vector relationship is obtained, in which the total excitation current is the vector sum of the charging current and the leakage current.

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**Any** increase in charging current will result from an increase in capacity (or apparent dielectric constant of the insulation). Also, any increase in leakage current will result from an increase in the conductance, G. A change in either of these current vectors is, of course, accompanied by a change in the power-factor. Since the introduction of water into this circuit would cause an increase in either or both current vectors, the ultimate effect is an increase in the capacity and particularly the power-factor of the dielectric. It is this effect—its magnitude and control in which we are interested, inasmuch as this phenomenon has a direct bearing on the electrical life and performance characteristics of the cable insulation.

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**The** determining feature for any insulation operating under an alternating-current stress is its electrical stability, for as soon as the insulation strength of the cable becomes erratic under a particular set of circuit conditions its usefulness to that circuit is terminated. For a power cable we can define the point of complete electrical instability as having been reached when the dielectric losses have become excessive enough to permit actual thermal failure of the insulation—under normal operating conditions. For a communication cable we might define this point as having been reached when the attenuation constants have increased so much that an acceptable level or quality of communications or signalling cannot be maintained. Absorbed moisture also causes a reduction in the surge and normal-frequency breakdown strength of the insulation. Therefore, insofar as absorption of water by cable insulation is concerned, the ultimate criterion is its effect upon the electrical stability of the cable in which it is used—all other effects being of secondary importance. The longer period of time that the electrical properties of the conductor insulation remain relatively constant in the presence of water, the better is the true moisture resistance of that insulation.

## Test Methods

**In a** technical paper "The Water Absorption Characteristics of Rubber Insulated Power Cable" as published in "The Electric Journal" for February 1939 the author disclosed an almost exact correlation between long-time unaccelerated moisture tests with measurements conducted on cables in actual service which were buried directly in the earth. These long-time tests involved the use of 1000-cycle capacitance values or, in some cases, dc resistivity plotted against immersed time of the insulated conductor samples in water at room temperature. A minimum of a two-years' immersion period was found necessary to determine whether or not the insulation could be established as an electrically stable material in water—such tests having been continued on many types of insulation for 5-year periods and longer.

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**While** such information was fundamental and helpful in adding to our knowledge, something of a more practical nature was needed so that the ability of any insulation to withstand water could be determined in a simple, repro-

ducible manner in a reasonably short time. Several short-time test methods based upon either Gravimetric methods or changes in electrostatic capacitance (usually at 1000-cycles) were proposed and investigated in which the accelerating influence was generally the water temperature. For some materials these tests provided a relatively truthful index of moisture resistance, but for certain other materials including some already known to be excellent as based upon service records, a completely false indication of true performance was obtained. Moreover, certain compounds known to have poor service records would exhibit satisfactory characteristics under these short-time tests. For example, it had been well established by years of successful service in wet locations that an oil-base, ozone-resistant insulation possessed excellent stability, but accelerated tests at high temperatures gave completely misleading results, whereas slightly lower test temperatures provided a more reliable indication of moisture resistance. The early heat-resistant super-aging natural rubber compounds proved to have poor moisture resistance as based upon service records—yet these short-time high temperature accelerated tests usually indicated they possessed very good moisture-resistant qualities.

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**The** need for short-time tests has been great and considerable progress by many investigators in this direction has been accomplished. Temperature of the water bath has been found to have a substantial accelerating influence, although caution is needed in establishing a maximum test temperature that will not alter results because of chemical or physical changes. For most materials and purposes a bath temperature of 50°C. has been found to be satisfactory. Further, the effects of thickness of insulation are reflected in the rate of change in insulation electrical properties—thus, relatively thin walls (preferably not less than 1/32″) of a given material on a conductor will disclose the effects of water much sooner than heavier coverings of the same material which may require several months immersion to indicate a correct trend of measurements.

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**In** performing electrical measurements it has been found that an increase in the applied test voltage will generally cause a truthful "acceleration." For example, measurements of power-factor and capacitance at 60-cycle voltages up to 80 volts per mil of insulation thickness provide a reliable means of testing insulated conductors intended for 60-cycle power service applications.

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**In** fairly recent action, ASTM and IPCEA have established standard methods for moisture absorption tests on insulated conductors as follows:

**(a) A gravimetric method which involves the increase in weight of a specimen immersed in water at 70°C. for 7 days. This test discloses the amount of water by weight that an insulation will absorb under a given set of conditions but it fails to tell where and how this moisture is dispersed within the insulation. This distribution of moisture affects electrical stability and can be evaluated only by an electrical test. However, for many materials whose electrical behavior in water is known, the gravimetric test may prove to be a useful control check, but the actual value of the test as a basis for comparing different materials is doubtful.**

**(b) An electrical test which consists of measurements of 1000-cycle capacitance of cable specimens immersed in water at 50°C. for a period of two weeks. This test in addition to the gravimetric method is recommended by IPCEA for communication cables. Most investigators feel that at least a few more weeks immersed time for the 1000-cycle electrical test might yield results which could be interpreted more clearly.**

**(c) An electrical test which consists of measurements of 60-cycle capacitance and power-factor at 40 and 80 volts per mil on cable specimens immersed in water at 50°C. for a period of two weeks. This is sometimes called the Stability Test and is the only test recommended by IPCEA for power and control cables.**

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**Details** and limits for each of these tests is described in the recent IPCEA wire and cable specifications, Appendix N.

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**While** it is believed that these tests furnish a good guide to the selection of insulation for use in wet locations for power and voice-frequency applications we would emphasize that there are limitations to these tests and that even more reliable criteria will be needed for the ever-increasing number of newer insulating materials. This subject is under continuous and vigorous study.

★ ★ ★

**An** investigation of insulations suitable for DC operation (signal and control cables) in wet locations is also under way. DC introduces the phenomenon of electro-osmosis which is similar to osmotic pressure. It is directional in its effect, dependent on the charge on the conductor and the chemical composition of the insulation as well as the surrounding water. Thus far it appears that those insulations such as Polyethylene which are the most stable electrically also possess the best properties for DC operation. However, all insulations suitable for AC operation are not all satisfactory for DC.

★ ★ ★

**Higher** frequencies imposed on insulated conductors introduces an element that appears to be highly sensitive to moisture effects. For example, the capacitance changes at radio frequencies are substantially equivalent to the moisture absorption effects as measured at 1000-cycles ***but*** insulation power-factor values measured at radio frequencies might easily rise to prohibitive values as compared with negligible power-factor changes at 1000-cycles. Thus, where dielectric losses at radio frequencies are of any design consequence the possible effects of moisture on insulation power-factor should be considered. Wet or even humid conditions might lead to surface leakage conditions on some insulations that would otherwise be satisfactory but could cause considerable difficulty on high-frequency wiring.

## Stabilization

**For any** geometric configuration other than a circular single conductor insulated wire, the difference between wet and dry exposure might substantially decrease the electrical efficiency of the cable simply due to the "electrode"

effect of presence of water—regardless of the degree of moisture resistance of the insulation.

★ ★ ★

**For example,** the mutual capacitance of a conventional twisted pair telephone wire immersed in water is nearly twice that of the same wire suspended in free air. This means that the effective talking range of the circuit is similarly reduced by changing from air to water as the outer electrode, since attenuation losses are directly proportional to the mutual capacitance. Such effects being independent of the moisture-resistant properties of the dielectric can only be corrected by cable design —called Stabilization. The use of an overall electrostatic shield would stabilize such a design so that there would be a negligible difference between wet and dry talking range. A high degree of stabilization could also be obtained by enclosing the twisted pair within an overall circular non-metallic sheath.

★ ★ ★

**The use** of shielding to obtain stable operation in voice-frequency communication cables is fairly well standard. Such shielding may consist of metallic tapes or braids, so-called semi-conducting layers, or a combination of these features. Of course, this shielding also provides other characteristics such as reduction of interference and cross talk, protection from lightning and other voltage surges, etc.

★ ★ ★

**On higher** frequency circuits such as some types of balanced solid dielectric RF transmission lines the problem of stabilization may *not* be as easily solved. Wetting of the surface not only increases the mutual capacitance with its subsequent effect on attenuation but the characteristic impedance of the line is similarly affected so that reflection losses due to impedance mismatch simply cause further decrease in efficiency. For these cases, careful design is required to obtain the highest degree of attenuation and efficiency.

## Test Results

**Figures** (1) and (2) show long-time test results (1000-cycle capacitance and power-factor) on some typical insulating materials. The excellent stability of Polyethylene is significant since this material is ideally suited for communication cable insulation because of its low dielectric losses.

★ ★ ★

**A brief** summary of the moisture-resistance of cable insulating material for low-frequency applications may be presented as follows:

*Thermoplastic—*

**Polyethylene: Excellent**
**Polyvinyl Chloride: Good**
**Ethyl Cellulose: Fair**
**Nylon: Fair**

*Poly-Fluorinated Ethylene—*

**(Teflon: Excellent**
**(Kel-F: Excellent**
**(Fluorothene: Excellent**

*Thermosetting—*

**Submarine Rubber Compounds: Very Good**
**Ozone-Resistant Compounds: Very Good**
**Performance Grade: Fair to Good**
**Code Grade: Poor**

**For higher** frequency applications Polyethylene and the fluorinated ethylenes are considered preferable.

★ ★ ★

**For DC** applications Polyethylene seems to be the best. Most polyvinyl chloride compounds are poor, although by proper choice of plasticizer a satisfactory compound can be achieved. Of the thermosetting materials, the submarine and ozone-resistant compounds are preferable to the others.

★ ★ ★

**Insofar** as the moisture-resistance of conventional sheath or cable coverings is concerned, they may be classified as follows:

**Polyethylene: Excellent**
**Polyvinyl Chloride: Very Good**
**Rubber or GR-S Jacket Compounds: Good**
**Polychloroprene: Fair**
**Fabric Coverings: Poor**

★ ★ ★

**It is** always considered good design practice *not* to rely on the sheath for moisture protection but to obtain the highest degree of resistance possible from the insulating material itself. There is always danger in too broad an interpretation of data and many materials having ideal moisture-resistant characteristics may, and often are, actually inferior to materials less stable in the presence of moisture but more stable in the presence of other operational conditions and hazards.

## Summary

**Contrary** to the situation only

(Please turn to page 422)

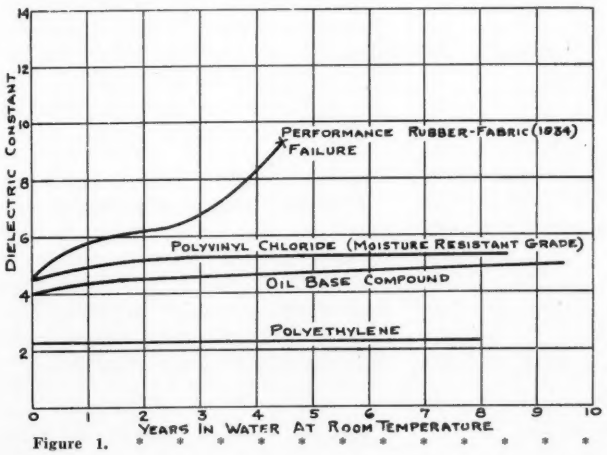


Figure 1.

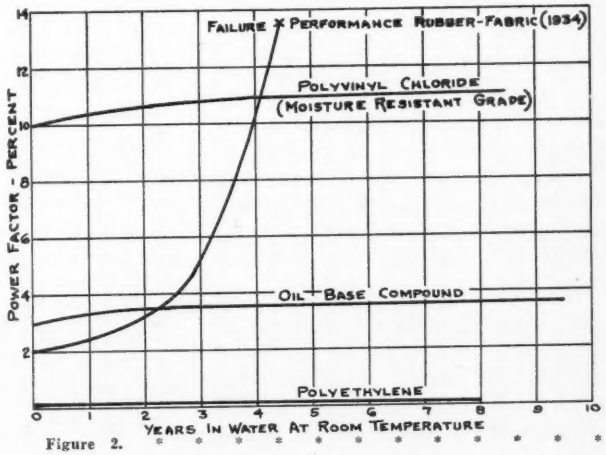


Figure 2.

# Safety in Wire Drawing Operations

by A. E. Asel, Safety Supervisor
Sheffield Steel Corporation
Kansas City, Missouri

**Mr. Asel delivered this paper at the Fortieth National Safety Congress in Chicago last October and it is published through the courtesy of the National Safety Council. In the article, the author outlines the causes of the more common accidents and describes the measures taken in his plant to avoid their repetition.**

**Wire** is used for the manufacture of everything from carpet tacks and strapless brassieres to cold-headed bolts and nuts and rivets. And wire manufacturing operations consume about 6 per cent of total steel ingot tonnage in the United States.

★ ★ ★

**At** Sheffield's Wire Mill in Kansas City, we have about 330 people producing bright, galvanized, annealed, manufacturers', straightened and cut and merchant wire, as well as nails, field fence and barb wire. In addition, we have about 275 employees working in departments which use drawn wire in the manufacture of reinforcing mesh and cold-formed bolt products. Our rod sections range from .219 inches to ¾ inches, our wire sizes, from .018 inches to .732 inches. Since our carbon ranges from .08 to .35, we would be classed as low carbon operators. Wire production consumes about 20 per cent of our total ingot tonnage.

★ ★ ★

**The** introduction of wire drawing gave birth to a new source of industrial injuries—and in many ways, the most serious injuries in the steel industry.

★ ★ ★

**As in** all industrial progress, we first learned how to make the machine and then we found that we had to learn how to control it. Yes, we've been drawing wire by mechanical means for over a hundred years, but we still haven't completely mastered the machine.

★ ★ ★

*In the Cleaning House*—Our cleaning house presents the usual hazards of acid handling. Sulphuric acid cars are discharged by air pressure into our storage tanks. The cars are protected by a derail and a track flag. Acid clothing and goggles are used by pipefitters in making hose connections and when servicing cars, storage tanks and the acid piping system. Deluge shower heads are placed strategically.

★ ★ ★

**Acid** is gravity fed from tanks into a lead-lined charging box for measuring. Plugs are then pulled from the bottom to allow acid to flow into funnel pipes which lead to cleaning tubs. This operation opens up splashing hazards that could be eliminated by the installation of enclosed flow meters.

★ ★ ★

**The** gantry crane operator dips the rods successively into a 4 per cent sulphuric solution, water rinse, and lime slurry. Fumes from the acid bath are held down by an inhibitor and we have not found respiratory protection necessary.

★ ★ ★

**Another** deluge shower is located near the acid tub.

★ ★ ★

**There** is a possibility of someone's falling into the tubs. This can occur when a coil slips off the pin and it is necessary to manually place it back on. It can also occur when pulling the drain plugs, preparatory to washing out the tubs. We don't have an answer for these situations and welcome any suggestions.

★ ★ ★

**Hand** slaking of lime presents well-known, but usually minor hazards. Education and the wearing of complete eye protection has minimized what hazards do exist.

★ ★ ★

**We use** a manually operated tramrail system for handling pins of rods. Pushing of loaded pins is a three man job. Here we have the hazard of open switches and of stockers being caught between pins or, of other people being struck by pins. Training stockers not to run with pins has minimized accidents from this source.

## Accident Sources on Wire Drawing Machines

*Caught in snarls*—In the past 7 years four wire drawers have been caught in rod loops while trying to untangle snarls. In one case, a man was pulled up against a butt welder; another caught his hand between a shoe pin and the rod; while the third man caught his finger between a rod and the hairpin hook.

★ ★ ★

**In all** three of these cases, the employee was attempting to untangle a snarl while the machine was running. The only answer that we know is to train the operators to shut machines down before they try to untangle snarls. The last accident of this type occurred over four years ago.

★ ★ ★

**Pointing** ends of wire has developed no lost-time cases. Safety glasses should prevent accidents arising from sparks and from wire ends flipping out of welding machines. No lost time cases have developed from butt welding.

★ ★ ★

*Caught between pullers or wire*

*and block*—Three of these cases in the last 7 years occurred while installing puller jaws on the wire. The most recent one explains them all. The wire drawer put his jaws on the point, pulled the wire a few inches and then "jacked" the pullers back on the wire to get a better grip. Before releasing his fingers from the jaws, he pulled on the control bar and his index finger was pinched off between the jaws and the block.

★ ★ ★

**Aside** from failing to follow the proper sequence of operations, his fingers were in a dangerous position and his stance was bad. We attempt to teach an operator to stand facing the die box, with his right leg against the control bar. If he grasps the jaws properly, they will be harmlessly pulled out of his fingers, should the machine start up before he takes his fingers off the pullers.

★ ★ ★

**Three** men in the past seven years have caught fingers between the wire and the block.

★ ★ ★

**In one** case the operator was brushing dirt away from the die box. In the other two cases, there is no definite reason known why the operators placed their hands between the wire and the running block. We do know that some old time wire drawers thought they could feel roughness on the wire as it emerged from the die box. We doubt that they can. If they can, it is certainly bad practice to try it while the block is turning.

★ ★ ★

*Breaking wire and flying pullers*—Breaks in wire are the source of many wire drawing accidents. I will not attempt to delineate or survey the myriad causes for breaks. Suffice to say that wire will break and that such breaks present a real hazard.

★ ★ ★

**The loss** of an eye due to a wire break some years back, gave impetus to the only way we know to prevent such things—the constant wearing of safety glasses.

★ ★ ★

**A badly** bruised arm and a fractured skull also resulted from wire breaks and flying pullers.

★ ★ ★

**The** fractured skull occurred when the loose pullers struck a part of the machine and knocked the jaw head off the chain. The flying head hit the wire drawer (12 feet away) in the head. The pullers have been improved since this accident.

★ ★ ★

**The** only way we know that such accidents can be avoided is for the wire drawer to keep a safe distance from his machine after starting it up.

★ ★ ★

*Clutch hazards*—Our newer continuous Morgan machines have clutches inside each block. The clutches permit the operator to idle a block and run the excess wire off it without having to cut his wire.

★ ★ ★

**Two** operators have been pulled into their machines while engaging these clutches. These men had their left hands on the clutch handles and were inching the blocks with the foot control in order to more easily engage the clutches. When the clutch engaged, the left arm was caught in the vertical bars of the revolving block. The arm was thus forcibly hinged backward and the operators were pulled into the revolving blocks.

★ ★ ★

**To avoid** such accidents we teach operators to manually turn the block so that they can operate the clutch handle with the right hand. Should the clutch engage before the operator realizes it, the revolving block will hinge the elbow the way nature intended and the arm will be automatically and harmlessly ejected.

★ ★ ★

*Electric Hoists*—We use 1,000 lb. electric hoists to handle drawn wire from the finishing block. An accident six years ago and another two years later taught us something about these hoists. They are equipped with rigid pipes, on the end of which are located the controls. A swinging bundle caught on the operator's hand as his fingers were operating the controls. The hoist kept going up, pinching his hand between the control pipe and the bundle, until the bundle finally slipped off the handle. We now have these handles bent out, well away from the swing of the bundles.

★ ★ ★

**An accident** in the cold heading department taught us the importance of guards on top of the hoist blocks. Operators occasionally will push on the blocks in operating these hoists. A cold header operator lost two fingers when they were pulled between the sheave and the moving hoist cable. I suggest you check these blocks, even though you know they are guarded.

★ ★ ★

*Stopping Devices on Wire Drawing Machines* — Our machines are equipped with the conventional stopping devices—the snarl switch and the shipper bar across the front of continuous machines.

★ ★ ★

**All of** our continuous machines are AC. A few of them have no braking devices. Most, however, are wired so that operation of any of the stopping devices in the control circuit will disconnect the AC power and apply DC power for braking. In other words, we stop the AC motor by applying DC power. Under average load the machines will coast about one revolution.

★ ★ ★

**The** bench-type machines are all DC and the control circuit has dynamic braking. The DC machines have no-load relays.

★ ★ ★

**We now** have all of our machines equipped with an electronic stopping device which was developed by our electrical department. This consists of the following: An electronic relay is installed in the control circuit. Contact between the back guard and the machine completes a low voltage circuit to the relay. The closing of the circuit to the relay causes the main

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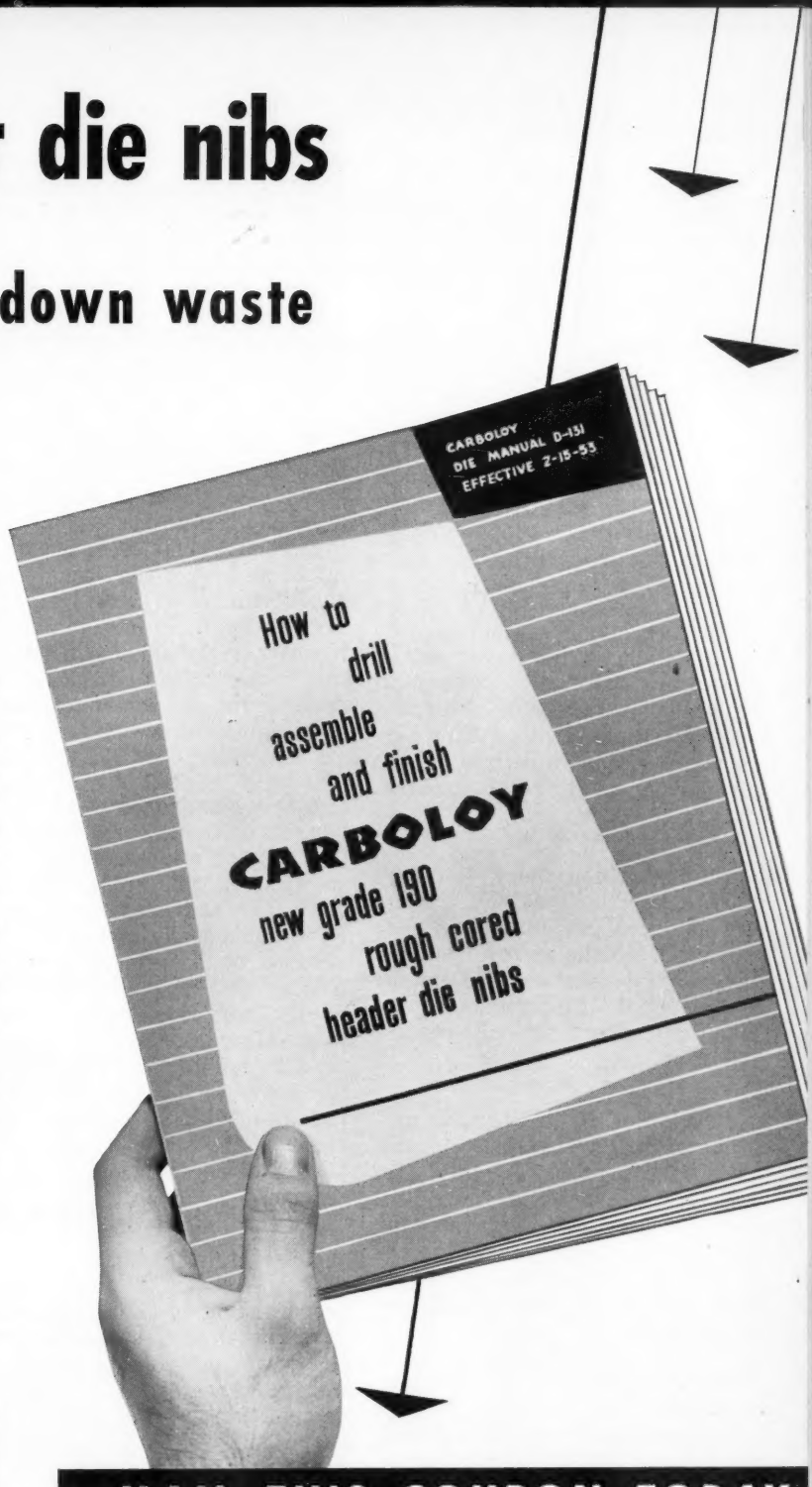


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breaker to open and thus cut off power to the machine.

★ ★ ★

**The** completion of this circuit is accomplished in this manner:

The electronic circuit is wired to the hinged back guard and to the machine. The circuit is interrupted, however, because the back guards are hinged on micarta insulating blocks. A broken wire or an operator's body will complete the circuit and thus shut off the power. The hinged back guard also actuates a hatch-type limit switch which in turn opens the control circuit.

★ ★ ★

**On** bench-type machines, we have installed a taut cable, across the operator's side. Mechanical movement of this cable also opens up the control circuits. This performs the same functions as the shipper bar on the continuous machines.

★ ★ ★

**No matter** how fancy we design guards, we know that wire drawers are going to get hurt, unless we can inculcate the safety idea into their consciousness. This can be accomplished through adequate training procedures and regular follow-up.

★ ★ ★

**In addition** to the regular program of safety meetings, inspections, investigations and publicity, we have a definite training procedure. A prospective operator works with an experienced operator for at least one week. He is then put on the continuous machine nearest the foreman's office. He works on this machine on a day-work basis until the foreman is satisfied that he is a safe, efficient operator. During this period, the foreman and the elected safety observer watch the operator reguarly and correct his mistakes. No attention is paid to the quantity of his production in the early stages of his training period. Safe practice is the number one consideration. Some students have stayed on this training machine for as long as four months and have still flunked out.

★ ★ ★

**Perhaps** the simplest and best known method of reducing accidents is through the medium of personal protective equipment. While safety glasses and safety shoes are basic, you and I know that the road to 100 per cent coverage is fraught with the greatest obstacle in the business—the inability of human beings to imagine that an accident can happen to **ME.**

★ ★ ★

**We have** as near 100 per cent coverage on safety shoes as it is possible to attain. I should, however, like to give one word of warning about shoe lace hooks. It would be best if they could be entirely eliminated in a wire mill. We do clip them off the shoes of blockers in the galvanizing department, but we have made no concerted effort to eliminate them in drawing operations.

★ ★ ★

**Safety** glass coverage is also 100 per cent. We of course have a few people that we occasionally have to warn on this score, but those cases are few and far between. Everyone usually wants to know about compulsion on safety equipment. Certainly, before you arbitrarily tell people they have to wear safety glasses, a lot of ground must be spaded. We went through the gamut of all the conventional tricks—movies, meetings, glass eyes and the like—and all of them played a necessary part of the scheme.

★ ★ ★

**However,** the solid substance with which we all must work is proper fitting by trained personnel, provision of adequate cleaning stations, we use silicone paper dispensers, sweatbands to keep the perspiration off the glasses, and above all, selling people on the need. After you have done all these things, you will still face some discouraging situations and you will always have to bear down on the 5 per cent who won't go along.

★ ★ ★

**When** I say discouraging situations, I think of the case of a father who lost his eye in another department because he didn't wear eye protection. His son who was working at the next machine still wasn't convinced that he should wear eye protection. It took time, but the son also lost an eye in exactly the same way on the same type of machine five years later. Yes, there are none so blind as those who will not see.

★ ★ ★

**I would** like to mention hard hats in connection with wire drawing operations. Three years ago one of our wire drawers noticed that the wire had broken on the top die of a double-deck block. Since there was tension on the bottom die, the machine was still running and the broken wire was describing an arc around the machine. In order to help his fellow worker, he went over to shut his machine down for him. As he reached for the controls, the loose end hit him in the temple, piercing the skull and going into the motor center of the brain. This man was instantly transformed from a reasonable, intelligent human being into a hopeless and helpless pile of bones and flesh. He may live out a normal life span, but he won't know it. A hard hat might have prevented this accident.

★ ★ ★

**Wire may** break from a variety of causes. If a wire breaks as a result of brittleness, we can expect the end to shatter when it strikes the die box, backguard or another block. For instance, we dug a piece of steel out of the arm of a wire drawer who was standing 25 feet from the point where a wire broke and then shattered. Certainly this piece could have punctured his skull.

★ ★ ★

**Bull block** operators are working with coiled bar stock sections up to 1-1/16 inch in diameter. Since these heavy sections are not butt welded, there are more bundles and the end of each bundle is going to be somewhat wild and can hit an operator in the head.

★ ★ ★

**In our** shop, we use the manually powered tramrail system for handling hairpins of rods between

(Please turn to page 421)

# Government Wire Production Information

## Beryllium, Chromium, Cobalt and Nickel

**The Office** of Price Stabilization has authorized producers and further processors and manufacturers to increase their ceiling prices so as to pass on to their customers certain increases in the cost of beryllium, chromium, cobalt and nickel.

★ ★ ★

**This action** is covered by General Overriding Regulation 43, effective February 27, 1953.

★ ★ ★

**For** beryllium copper master alloy the pass-through is on the basis of an increase of 5.22 cents a pound of contained beryllium, as authorized on February 13, 1953, under Supplementary Regulation 133 to the General Ceiling Price Regulation (GCPR).

★ ★ ★

**For** chromium metallurgical products (except stainless steel) the pass-through is on the basis of an increase of 3 or 4 cents a pound, as specified, of contained chromium, as authorized on November 24, 1952, under Ceiling Price Regulation 180.

★ ★ ★

**For** cobalt the pass-through is on the basis of an increase of 30 cents a pound of contained cobalt for products in the production of which cobalt is used.

★ ★ ★

**For** nickel the pass-through is on the basis of an increase of 3½ cents a pound of contained nickel for products in the production of which nickel is used. The 3½ cents a pound increase in the cost of nickel reflects the recent increase in the cost of Canadian nickel.

★ ★ ★

**For** nickel and chromium used in stainless steel the pass-through is based on an increase of 2 or 3 percent, as specified, applied to a seller's current selling price, provided his current selling price does not exceed his authorized adjusted ceiling price.

★ ★ ★

**The** regulation provides methods of determining, calculating and applying the price increases which are permitted in order to reflect the specified cost increases for the various metals involved.

## Price Decontrol Actions

**Copper and aluminum** were added to the list of commodities exempt from price controls.

★ ★ ★

**Decontrol** was likewise ordered for producers of bolts, nuts, screws, rivets, mechanical preci-


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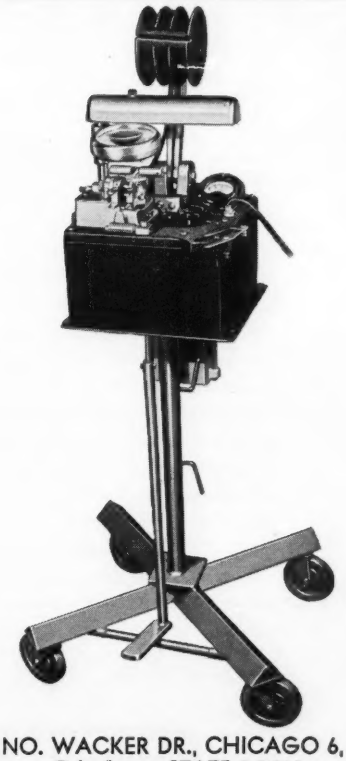

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**Removal of** ceilings on copper and aluminum, metals, ores, concentrates and mill products at all levels of production and distribution leaves steel as the only major metal still under price control.

★ ★ ★

**Mr. Freehill** said ceilings are being lifted on copper and aluminum to relieve a serious supply situation resulting from a reduction in the flow of these vitally needed metals. Information reaching OPS, he said, indicates producers are caught in a "squeeze" because of price differentials existing between primary and secondary copper and aluminum.

★ ★ ★

**Price** controls on scrap and secondary metals were eliminated February 12.

## Premature Disposal of OPS Records

**Price Stabilizer** Joseph H. Freehill has cautioned against premature disposal of business records required under the price control program.

★ ★ ★

**Mr. Freehill** said that as price control regulations are revoked, affected businessmen need not maintain records concerning transactions entered into after the effective date of the decontrol action.

★ ★ ★

**But** he added that they must preserve for specified periods of time whatever records they were required to have before decontrol was ordered.

★ ★ ★

**In** other words, he said, decontrolled businesses need not make or keep records on future transactions, but must keep available for inspection the records formerly required by the regulations covering them.

★ ★ ★

**While** different regulations prescribe different periods of time for which records must be preserved, Mr. Freehill stated the maximum period for retention of records is

two years after the expiration of the Defense Production Act.

★ ★ ★

**For** details of the records which must be preserved, and for special provisions granting exemptions or modifying the time limits, Mr. Freehill referred businessmen to the specific regulations under which they have been operating.

★ ★ ★

**The OPS** policy has been to limit record-keeping requirements to the minimum consistent with enforcement needs.

### Price Decontrol Actions

**Removal** from price controls of a broad range of commodities and a limited number of services has been announced by Joseph H. Freehill, Director of Price Stabilization.

★ ★ ★

**The** actions, the second taken by OPS in carrying out the Directive of the President that price controls shall be removed in an orderly manner, became effective Thursday, February 12, 1953.

★ ★ ★

**Commodities** and services affected are:

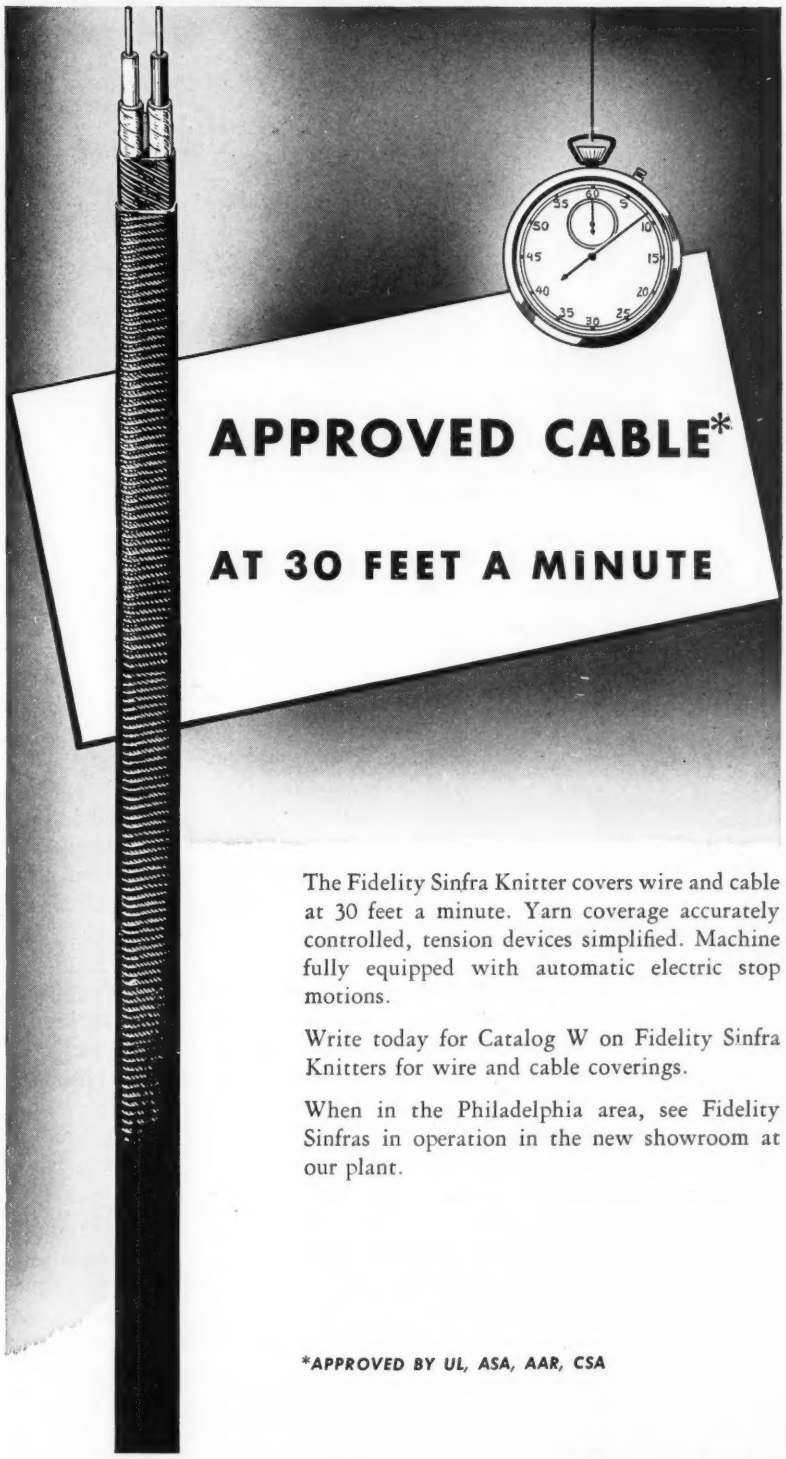
**Crude rubber, tires, and all rubber products**
**All scrap and secondary metals**
**Castings and forgings**
**Soaps, cleansers and detergents**
**Poultry, eggs and allied products**
**Construction services**
**Rentals of most industrial machinery and equipment**
**Prefabricated housing**
**Lead, zinc, tin and most minor metals and minerals**
**Paints, varnishes and lacquers**
**Paper, pulp and paper products, including newsprint**
**Fats and oils, except oleomargarine**
**Iron ore**
**Petroleum, gas and products, except No. 2 heating oil**
**Collapsible tubes**
**Metal cap closures**
**Window glass**
**Glass containers**

★ ★ ★

**These** items represent about 15 percent of the wholesale price index weights assigned to commodities in the BLS wholesale price index.

★ ★ ★

**Businesses** decontrolled by recent actions need not make or keep


The Fidelity Sinfra Knitter covers wire and cable at 30 feet a minute. Yarn coverage accurately controlled, tension devices simplified. Machine fully equipped with automatic electric stop motions.

Write today for Catalog W on Fidelity Sinfra Knitters for wire and cable coverings.

When in the Philadelphia area, see Fidelity Sinfras in operation in the new showroom at our plant.

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*Designers and Builders of Intricate, Automatic Precision Machines*

**FIDELITY MACHINE COMPANY, INC.**

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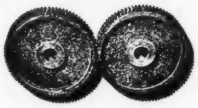

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# 3 ways *Solar* solves a sales problem... IN YOUR FAVOR

## ...with SOLDURA GRAY WIRE COLOR SOLUTION

**1 GREATER SALES APPEAL!**

Gray Soldura gives the buyer visible evidence that the flame-proof compound on non-metallic sheathed cable and service entrance cable is completely sealed and covered. Moreover, it camouflages service entrance cable used on white houses and forms an excellent base for the subsequent application of house paint.

**2 STAYS CLEANER!**

Gray Soldura *looks* cleaner because it *is* cleaner. It's used with a clear wax top dressing (which makes it easier to pull through joists or fish through conduits) and will not mark up walls during installation. Workmen's hands stay cleaner, too.

**3 PROTECTS against STICKING!**

Actual laboratory tests have shown that gray Soldura, applied with a proper saturant and finish, will prevent sticking at temperatures as high as 140°F. and will not flake off under freezing conditions.

***FOR GREATER SALES APPEAL... FOR CLEANER APPEARANCE, EASIER HANDLING, AND FREEDOM FROM STICKING OR FLAKING... USE SOLDURA... THE GRAY WIRE COLOR SOLUTION THAT BUILDS SALES.***

**SPECIFICATIONS***

| | |
|---|---|
| Weight per gallon | 15-16 lbs. |
| Total solids | 75-80% |
| Viscosity, Gardner Mobilometer @ 77°F., 250 grams load | 15-20 seconds |
| Estimated coverage—Sq. Ft. per gal. | 1250-1500 |
| Number of coats recommended | Two, for best results |
| Colors | Light, medium and dark gray |

**Gray Soldura is soluble in alcohol, acetone, and common lacquer solvents, but is not soluble in gasoline and petroleum solvents.*

FOR SPECIFIC INFORMATION ABOUT GRAY SOLDURA MS-551 AND A COMPLETE REPORT ON OUR LABORATORY TEMPERATURE TESTS, WRITE TO SOLAR COMPOUNDS CORPORATION.

*Solar Compounds Corporation*
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The Originator of Wire Color Solutions
1213 WEST BLANCKE STREET • LINDEN, N. J.


records on future transactions, but must keep available for inspection whatever records were required by the regulations under which they have been operating.

### Brass Mill Men Ask Copper Price and Allocation Decontrol

**Discontinuance** of government controls on prices of primary copper and brass mill products, as well as removal of all controls on copper raw materials allocation was recommended by the brass mill Industry Advisory Committee meeting with the National Production Authority recently.

★ ★ ★

**Unaminously** the committee recommended that price ceilings on brass mill products and primary copper be decontrolled immediately or else production within the industry would be further drastically curtailed. Committee members said that increased costs and recent decontrolling of the price of non-ferrous scrap has resulted in chaos in the brass mill industry.

★ ★ ★

**Committeemen** said that removal of price controls on scrap had not brought "scrap out into the market." Scrap sellers were continuing to hold their stocks expecting higher prices when primary copper price ceilings are removed and prices rise.

★ ★ ★

**The committee** said that:

**1. Brass mills could shut down because of the lack of scrap.**

**2. Immediate action was needed because the situation was serious.**

**3. The removal of price controls on non-ferrous scrap should have been accompanied by similar actions on primary copper and brass mill products.**

**4. Nobody now seems to know exactly the price of scrap.**

**5. If scrap doesn't come in soon, curtailment of operations and unemployment will result.**

★ ★ ★

**A majority** of the committee recommended removal of allocation controls, several members dissented because the small mills feared they would not get supplies from primary producers and furthermore large users would be at an advantage if the demand exceeded supply.

## Wire and Cable Makers Find Price Situation Confusing

**Six** recommendations were made by the Wire and Cable Industry Advisory Committee at its meeting with the National Production Authority on February 20th.

★ ★ ★

**Members** said their industry is presently in a very confused state because of the decontrol of prices on copper scrap and on refined copper made from secondary metal having a scrap content of more than 25%, thus resulting in a multi-pricing system.

★ ★ ★

**Officials** said they believe the supply and demand for copper may reach a balance after the decontrol of copper prices. They foresaw the possibility that copper will be substantially more abundant after price ceilings are lifted.

★ ★ ★

**The** six recommendations follow:

**1. That all price controls on copper, copper products, aluminum and aluminum products be discontinued immediately.**

**2. That a priority band be established for direct military requirements and that all other limitations on the sale and use of copper and copper products be abandoned effective in the second quarter of 1953.**

**3. That if the second recommendation is found impractical, all allocations of copper raw materials and all limitations on toll agreements by controlled material producers should be discontinued as soon as possible after the elimination of copper price controls.**

**4. That this committee be heard by Government officials regarding these recommendations before any final determination is made which, in effect, would be contrary to today's recommendations.**

**5. That in the event a priority system for direct military orders is established after the end of the Controlled Materials Plan such priorities should not cover refined copper.**

**6. That this committee be continued on a standby basis after the March 31st expiration date.**

## Capehart Adjustments by Machinery Manufacturers

**OPS** has announced that the deadline for manufacturers of machinery and related products, who price by formula, to refile for their so-called Capehart adjustments has been extended indefinitely.

★ ★ ★

High Quality High Carbon Wires
Progress, you must admit, always involves a certain risk. After all, you can't steal second base and keep one foot on first.
Yes, the Johnson pioneers took risks in a highly competitive field—but by becoming specialists in certain types of wire, we were able to devote all our attention to making perfect such items of Music Wire—high carbon steel wire of the highest quality, in steel analysis, in physical characteristics, roundness, finish.
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JOHNSON STEEL AND WIRE COMPANY, INC.
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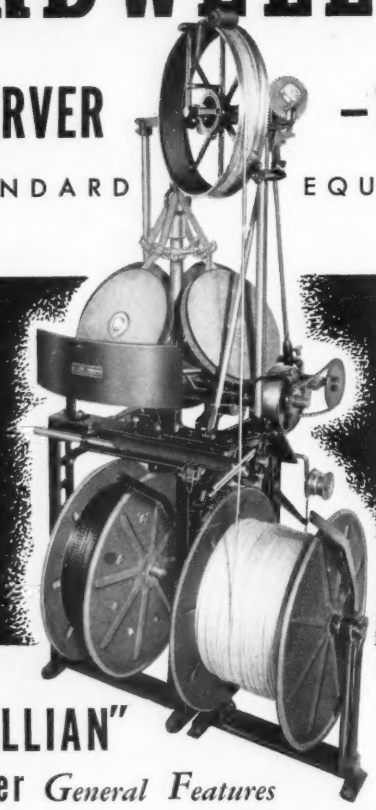
A SUBSIDIARY OF PITTSBURGH STEEL COMPANY

# WARDWELLIAN®

## PAPER SERVER —TYPE "C"

STANDARD EQUIPMENT



Another in the outstanding series of Wardwell serving machines. This machine is designed to serve four ends of flat paper to electrical conductor for the production of Non-Metallic Sheathed Cable.

Paper passes through a die located at serving point, thereby producing a product with a firm, smooth finish and of uniform diameter over its entire length.

## "WARDWELLIAN" Paper Server *General Features*

- Machine is equipped with electric stop-motion.
- Production dependent upon requirements. Will produce 1407 feet per hour when machine is applying material at 10.6 turns per foot.
- Standard set of twelve change gears furnished with each machine.
- Serving head speed 250 RPM.
- Driving pulley 8" diameter; 1¾" belt. Speed 575 RPM.
- Ratio pulley speed to serving head speed 2.3 to 1.
- Capstan 18" diameter, 3" face.
- Opening through serving head ⅝" diameter.
- Supply packages 14" diameter, 1½" hole; paper up to 1½" wide, .003" thick.
- Maximum power requirements .6 HP including power transmission equipment.
- Motor drive can be furnished upon request.
- Stands can be furnished to accommodate reel 30 inches in diameter with overall widths up to 16 inches.
- Special windup driving parts required for reels with drums under 8" diameter.
- Reels are not included with machine.
- Weight approximately 508 lbs.
- Weight crated for domestic shipment approximately 615 lbs.

Counter for measuring product in feet or yards furnished upon request.

There are nearly thirty different applications for Wardwell equipment, including Braiding, Shielding with wire, Tape Serving, Yarn Serving, Asbestos Serving, Paper Serving, Armor Serving and Resistance Wire Serving.

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*Wardwell*
BRAIDING MACHINE CO.
CENTRAL FALLS, RHODE ISLAND, U.S.A.


**On** January 7, 1953, OPS amended the provisions of SR 4 and SR 8 to CPR 30 and stipulated that manufacturers pricing by formula could not use their so-called Capehart adjustments after January 31, 1953, unless they refiled OPS Public Forms 100 conforming to the amendments. On January 30, OPS extended this deadline date to February 28.

★ ★ ★

**Since** price controls are scheduled to expire on April 30, 1953, consideration is now being given to the sequence in which all commodities should be exempted from price control in an orderly manner. Therefore, it has been determined that the deadline date for these manufacturers to refile for Capehart adjustments should be postponed indefinitely.

★ ★ ★

**This** action is covered by Amendment 7 to SR 4 and Amendment 5 to SR 8 under Ceiling Price Regulation 30, effective February 28, 1953.

### More Copper to Come from Arizona

**Nearly** a quarter of a billion pounds of copper will be recovered from an undeveloped deposit of low-grade ore in the Globe-Miami Mining District of Arizona as result of an agreement announced in February by the Defense Materials Procurement Agency.

★ ★ ★

**Howard I. Young,** Deputy Administrator of DMPA, said a purchase contract has been signed with the Miami Copper Company for production of 230,000,000 pounds of refined copper from an ore body extending out from a deposit of higher-grade ore which the company has been working since 1906 and which is now nearing depletion. It is an underground operation.

★ ★ ★

**The** grade of the ore in the undeveloped portion of the mine is so low—averaging only 10 pounds of recoverable copper per ton of ore—that extension of the present mining operation after the higher-grade ore is exhausted would be

out of the question under the copper ceiling price of 24.5 cents a pound.

★ ★ ★

**The company,** however, has agreed to undertake production at a price of 27.35 cents a pound (f.o.b. Connecticut Valley points) or 2.85 cents a pound over the present ceiling. This has been guaranteed by DMPA.

★ ★ ★

**If the** present operation, with its town and labor force, its plant and underground installations, were to close down, the cost of opening up the low-grade deposit at some future time probably would be prohibitive. As it is, the only large expenditure involved will be the development of the new ore body itself. This the company will do at its own expense, estimated at $3,000,000. The company's long experience in the development of low-cost methods of underground mining—especially block caving—was another important factor in the negotiation of the contract.

★ ★ ★

**Production** from the undeveloped Miami deposit is expected to get under way during the first six months of 1955. In addition to the 230,000,000 pounds of electrolytically refined copper, the deposit is expected to yield a considerable amount of molybdenum. Moreover, the Government has an option on 120,000,000 pounds of refined copper from the present mine at the average market price for the month of delivery.

★ ★ ★

**The** contract runs to June 30, 1962, but the company reserves the right to cancel if the new project becomes a losing proposition and the losses reach a stipulated point.

## Steel Industry Shipments in 1952 Decreased Due to Strikes

**As** a result of the major strikes which curtailed operations in the industry, finished steel product shipments in 1952 totaled 68,003,612 tons, a decrease of nearly 11,000,000 tons from the 1951 record year, **American Iron and**


*Efficient Pickling with . . .*

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**PICKLING ACID INHIBITORS**

**Use RODINE in sulfuric and muriatic acid baths for improved pickling and increased production.**

**In straight line pickling of wire, rod and tubing, RODINE makes available more metal for drawing by protecting steel from acid attack. In batch pickling of sheet steel, RODINE improves the surface. In rapid, continuous strip pickling, RODINE not only saves acid and metal, but also prevents over-pickling during line shutdowns.**

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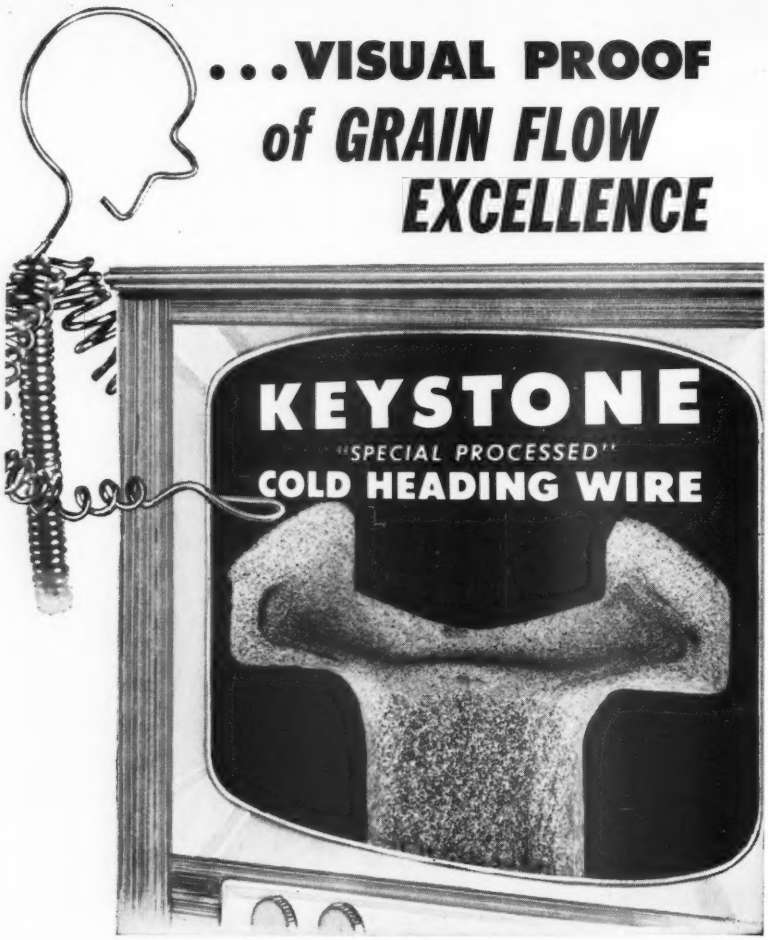
**AMERICAN CHEMICAL PAINT COMPANY**

**AMBLER, PENNA.**




The above macrograph offers visual proof of the uniform grain flow characteristics in a recessed-head screw made from Keystone "Special Processed" Cold Heading Wire. The continuous, strength-giving flow lines indicate efficient cold heading which results in longer die life, increased production and a better finished product.

The following analysis of "special processed" wire is recommended for difficult cold heading.

C1006–C1012 for Clutch Heads
C1006–C1022 for Phillips Heads
C1108–C1109 for Phillips Head Wood Screws
C1035–C1038 for Heat Treated Screws and Bolts

**Keystone Steel & Wire Company**
**PEORIA 7, ILLINOIS**


**Steel Institute** announced recently. However, while the loss of production time was approximately two months or 16.7 per cent of the year, shipments were off only 14 per cent from 1951, indicating the rapid post-strike recovery.

★ ★ ★

**Steel** distribution was completely governed throughout the year by the Controlled Materials Plan, with the result that a greater proportion of total shipments were used for defense needs than in 1951. Despite the reduced total supply, the manufacturers of direct military items such as tanks, shells and guns, received nearly 2,100,000 tons of steel in 1952, up 900,000 tons or 75 per cent from 1951. Shipbuilding also received an increase over 1951 with its percentage of total shipments going up from 1.1 to 1.5 and tonnage increasing by approximately 143,000 tons. Functioning of the foreign assistance program is shown by the increase in exports of steel mill products, which in 1952 totaled about 3,300,000 tons, or 500,000 tons greater than in 1951.

★ ★ ★

**Warehouses,** which are the major source of supply for the thousands of small business enterprises using steel, received 13,300,000 tons in 1952, which is about a million tons less than in 1951. However, this is an increase in the proportion of total shipments from 18.5 per cent in 1951 to 19.8 per cent in 1952. Shipments for oil and gas industry uses, as revealed by sub-groups of the Warehouse and Construction classifications and the Oil and Gas Drilling classification, amounted to about the same proportion of total shipments in 1952 as in 1951, totaling 4,500,000 tons or 6.8 per cent.

★ ★ ★

**Under** CMP control, 1952 shipments to several major markets, including automotive, construction, rail transportation and consumer goods classifications, showed a decrease both in tonnage and in per cent of total shipments when compared to 1951 performance. All other market classifications, while

receiving less steel because of the strike-curtailed production, nevertheless maintained about the same percentage proportion of the total shipments.

★ ★ ★

**Analysis** of the 1952 shipments by steel mill products further illustrates the effect of the Defense Program and complete controls. Bars and semifinished made up a greater proportion of total shipments in 1952 than in 1951 as a result of the emphasis on ordnance. Pressure tubing, essential for industrial power plant expansion and various military items, showed an increase in tonnage over 1951. Flat rolled products in general were reduced in their proportion of total shipments, corresponding to the reductions to the automotive and other consumer goods markets. Furthermore, the facilities for rolling light flat rolled products were used to a large extent in the production of plates for defense needs. The trend from hot dipped to electrolytic tin plate continued in 1952 with electrolytic shipments more than twice as large as hot dipped. Shipments of railroad materials and wire and wire products also decreased in relation to total shipments.

## Scovill Manufacturing Company Announces Price Changes

**Following** the de-control of copper prices by OPS in March, which immediately resulted in markedly increased prices for copper, **Scovill Manufacturing Company** announced price adjustments on its brass mill products and scrap effective at the opening of business, March 2.

★ ★ ★

**The** advances reflect not only the increased price of domestic copper, but also higher labor and transportation costs and reduced prices of zinc.

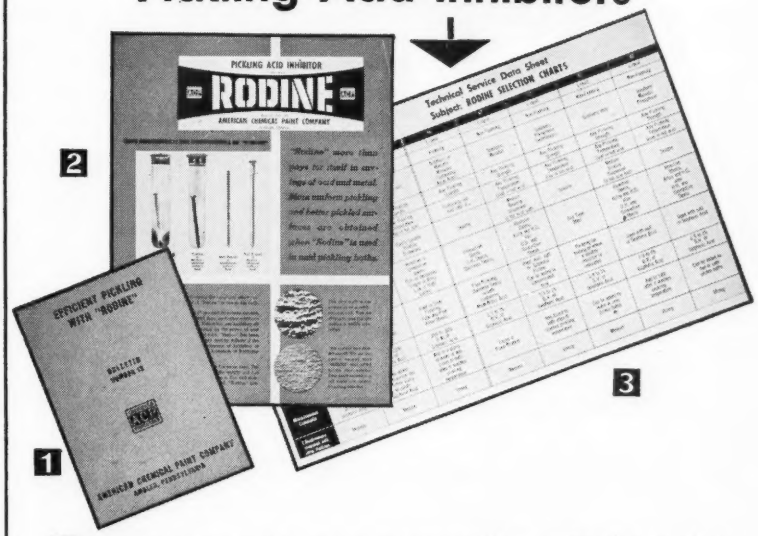
★ ★ ★

**A** partial list of new base prices to go into effect immediately includes: yellow brass sheet, 42.03¢ per pound; yellow brass wire, 42.32¢ per pound; yellow brass tube, 44.94¢ per pound; free-cutting brass rods, 35.92¢ per pound; and copper tube, 48.92¢ per pound.


New Data Available on . . .

RODINE®

Pickling Acid Inhibitors




**1** The standard reference work on pickling, "Efficient Pickling With RODINE" — Bulletin Number 13 — is now available in a new, revised edition.

**2** This new 4-page general descriptive folder presents essential information on "Rodine" pickling acid inhibitors.

**3** The recently revised "RODINE SELECTION CHART" gives characteristics of and uses for typical "Rodines" used with sulfuric and muriatic acids. Technical Service Data Sheet No. 13-1-1-4.

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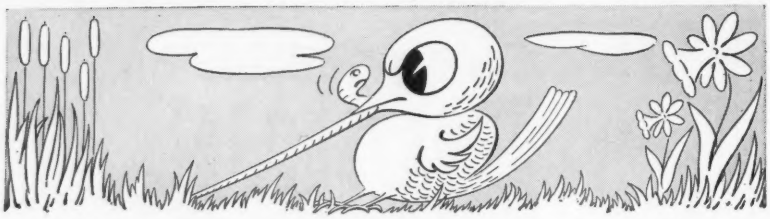

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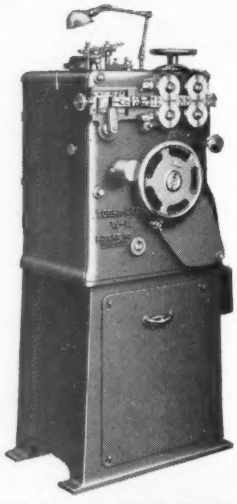
In spring coiling, the words "Torrington" and "Versatile" are synonymous! When you desire springs produced to meet exacting requirements, just call the professional springmaker who has a Torrington coiler. He's the man who can fill your needs with accuracy, speed and economy. On special springs, our sales department will gladly assist you in finding a source of supply, or help your springmaker devise just the right tooling to produce it.

Torrington's 14 different Spring Coilers cover a range of wire diameters from .003" to .750"



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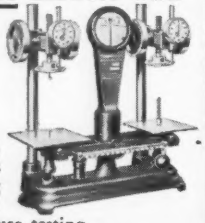

An accurate, uniform and inexpensive means of measuring spring load and deflection! For inspection or in-use testing . . . to aid in designing and developing springs for specific uses or as a basis for statistical quality control. Write today for illustrated bulletin on the Torrington Spring Tester!

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## Bethlehem Pacific Now Producing Baling Wire in Coils

**Wire coils** for automatic hay balers are now being produced at Bethlehem Pacific's Los Angeles Steel Plant. Production of the new product, which is completely integrated from steelmaking to finished product, was recently started following installation of new spooling equipment.

★ ★ ★

**Regarded** as another vital product addition to the list of both merchant and finished steel items being made available to consumers in Southwestern United States by the Los Angeles Plant of Bethlehem Pacific, R. J. Tremblay, General Superintendent, pointed out that California's agricultural industry ranks as the state's largest basic activity in terms of value of products grown, and the production of hay and alfalfa is the second most important item to that industry and that rapid strides in the increased production of this vital commodity are due, in part, to the development in recent years of automatic baling equipment now available to growers.

★ ★ ★

**Mr. Tremblay** cited this new production service of automatic baling wire drawing and spooling at Los Angeles by Bethlehem Pacific as contributing to the future growth of California's agricultural industry.

★ ★ ★

**Bethlehem Pacific's** automatic baling wire will be produced for convenient use in three separate "package" groups and specifications, including an interim coil, thus providing proper sizes for all baling equipment now available in the field. This wire is produced in accordance with standards established by the American Society of Agricultural Engineers.

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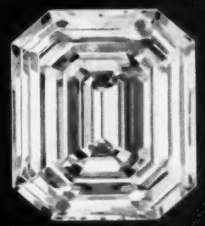
You *pay* for the best when you buy high carbon wire. Make sure that you *get* it! Always specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.



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## New Bulletin on Silicone Rubber

**The** properties and processing of silicone rubber as an insulating material for wire and cable are set forth in a new bulletin (No. CDS-13) issued by the **General Electric Company's Chemical Division.**

★ ★ ★

**Titled,** "Silicone Rubber: A New Insulating Material for Wire and Cable," the bulletin is a reprint of a recent trade journal article written by M. G. Noble, a G-E silicone engineer. Mr. Noble has included a full description of the processing of silicone rubber and a wealth of property data illustrated with charts and tables. A section on applications deals in detail with the use of the heat and flame resistant material for Navy and ignition cable.

★ ★ ★

**Copies** may be obtained from the Chemical Division, General Electric Company, Pittsfield, Mass.

## Hairpins and Bobby Pins Take 10,000 Tons of Steel

**The** steel industry supplies about 10,000 tons of steel wire a year for hairpins and bobby pins to hold ladies' tresses in place according to American Iron and Steel Institute. The vast number of pins made from this tonnage is indicated by the fact that an individual hairpin weighs a little less than 1/100 ounce and a bobby pin is only slightly heavier.

★ ★ ★

**About** 8,000 tons of the total tonnage of wire consumed by the industry is in the form of flat or half-round wire used to make bobby pins. Coils of the wire are fed into a machine which bends a short length of steel over on itself, cuts the pin to finished length, corrugates or crimps one prong of the pin—in short, turns out the finished article at one operational stand.

★ ★ ★

**The** remaining 20%, or 2,000 tons of steel wire is used each year to make hairpins. These pins are frequently made from 25 gauge (0.0204 in.) wire, although there is a demand for heavier gauge pins, usually from foreign countries where heavy tresses are fashionable.

## Abstracts

THE PRODUCTION OF FINE GAUGE RESISTANCE WIRES, Johnson Matthey & Co. Ltd. *Electron Engg.* 1953, Vol. 25 (299) p 36 (Jan.). Co. supplies resistance wire in base metal and precious metal alloys in dia down to 0.0005 in. Production described briefly. In general, sintered tungsten carbide dies used for dia down to about 0.060 in. Below this, *diamond* dies used, dies and cones being completely submerged in special lubricant. At about 0.008 in dia, wire transferred to fine wire-drawing machines in which lubricant restricted to *diamond* die, highly polished drawing cones being left dry to ensure satisfactory operation. Wire has to be annealed at various stages and after drawing may be supplied hard bright, bright annealed or oxidized surface. Die quality and maintenance must be of highest order; continuous inspection of dies and wire necessary. Dies generally re-profiled in vertical needle type machines in which die rotates while steel needle carrying *diamond* paste reciprocates in hole. Final polishing usually carried out by wire carrying *diamond* paste and reciprocating in rotating die. Reprofiling and polishing increases dia, and die starting life at 0.0003 in. will progress step by step to larger sizes until no longer suitable for service. History sheet kept for each die gives details of origin, size, characteristics and weight of wire drawn. 4 illustr.

★ ★ ★

DIE NIVAFLEX-ZUGFEDER. THE NIVAFLEX TENSION SPRING, R. Straumann. *Die Uhr,* 1952, Vol. 6 (23) pp 8-9 (Dec. 9) (In German). 'Durober' tension spring, rustproof and almost unbreakable, produced in 1926. Although not popular with German manufacturers, it was used in about 50,000 watches exported to India and USA. Life of springs in India has always been a great problem, but in watches returned for checking after 15 yr., 'Durober' springs had not altered or failed. Post-war development of 'Durober' is 'Nivaflax'. Fatigue in steel springs is considerable after 48 hr., none observed in 'Nivaflex' type after winding 3,300 times. Illustr. shows 'Nivaflex' not broken after winding 3,200 times, broken after 8,100 times. Other data: modulus of elasticity, 21,500 to 23,000 kg/sq mm; elongation 0.5 to 1%; ultimate strength, 200 kg/sq mm, and elastic limit, 170 to 180 kg/sq mm. 2 illustr.

★ ★ ★

CEMENTED CARBIDES FOR DRAWING AND PRESSING DIES, US Dept. Commerce, Office Techn Services; US Mutual Security Agency, Prod & Techn Asst. Div. *Question & Answer Service,* IR-6492 4 pp. Information required on drawing and pressing dies from sintered carbides. Answered by ref. to articles in journals and books on powder metallurgy.

★ ★ ★

HARTMETALL-ZIEHSTEINE. HARDMETAL DRAWING DIES. Anon. *Draht-Welt* 1952, Vol. 38, (24) pp, 291-292 (Dec. 25). (In German). Description of new polishing machines produced by K. Scholz, Berlin: multiple spindle, drilling and polishing machines for sintered carbide and 2 types of needle grinding machines. 6 illustr.

★ ★ ★

MECHANIZED WIRE WORKING IS UNDER CLOSE QUALITY CONTROL, Anon. *Machinist,* 1952, Vol. 96, (50) pp, 2023-2025, (Dec. 13). Photographs show various installations for production and control. *Diamond* dies are re-sized with sewing needles, olive oil and *diamond* dust (sifted to desired grain size) in individually reciprocating heads in machine; needles air-vibrated. Tolerance. *Diamond* dies with electrolytically produced holes are thus brought up to next wire-drawing size when hole wears out of tolerances. Approx. 18 dies sized by machine in 8 hr. day. 8 illustr.

★ ★ ★

SAVING DIAMOND POWDER IN THE MANUFACTURE OF DIAMOND DIES, A. W. Ploegsma. *Ind. Diamond Rev,* 1953, Vol. 13, (146) pp 11-13 (Jan.). Saving in *diamond* powder is important for *diamond* die polishing factories as powder used is equal in weight to weight of stone to be drilled and polished. Waste can be prevented by asking operator to pay small nominal sum for each ct. *diamond* powder consumed. If this is less than amount allocated in advance, he obtains a bonus; otherwise a deduction. Efficient means described for saving *diamond* powder. 4 illustr., 1 ref.

★ ★ ★

BIBLIOGRAPHY ON WIRE, Anon. Iron & Steel Inst., London, SW 1. Bibl. Series No. 13. 146 pp, authors' index, 1947 reprinted 1952. Price to non-members 10s. No. 13a. Mimeographed, 97 pp, authors' index, 1952. Price to non-members 25s. The two publications give an up-to-date survey of the literature on wire. The original bibliography was prepared at the request of the drawing committee of the British Iron & Steel Research Association and includes data from the bibliography on iron and steel wire compiled by the Carnegie Library of Pittsburgh in 1936. The subject matter is divided into 4 groups: (*a*) theory, (*b*) manufacture, (*c*) practice and tests, and (*d*) textbooks. In many cases the references are supplemented by an abstract. This compilation can be regarded as a most useful contribution to the literature on wire. See also *Ind. Diamond Rev.,* 1948 Vol. 8, p 156.

## 1952 Nickel Production

**It** is estimated that the free world output of nickel in 1952 exceeded 315,000,000 pounds, compared with 295,000,000 pounds in 1951. Canadian production amounted to approximately 280,000,000 pounds, or about 90 per cent of the total.

# Outstanding Personalities of the Wire Industry

## To Manage Distributor Sales for Riverside Metal

**Pembroke W. Taylor** has been named manager of distributor sales of the Riverside Metal Company according to an announcement by John Gribbel II, vice president of sales. His headquarters will be in Riverside.

★ ★ ★

**Mr. Taylor** formerly with the warehouse branch, copper division, in the National Production Authority, was with Revere Copper & Brass, Inc., for twenty years, prior to his NPA service. He resides in West Hyattsville, Md.

## Reliance Electric Appoints Distributor and Announces Sales Staff Changes

**Appointment** of a new sales agent and distributor in Omaha, Neb., and Des Moines, Ia., and selection of a new branch manager at Rockford, Ill., for **The Reliance Electric & Engineering Company** were announced recently by **E. E. Helm,** sales vice president. Reliance manufactures electric motors for industrial applications.

★ ★ ★

**The Armature & Electric Machine Company,** with offices at 1708-10 Jackson Street, Omaha, and 1485 Keosauqua Way, Des Moines, is the new sales agent and distributor.

★ ★ ★

**Dale D. Drollinger,** attached to Reliance's Cincinnati sales application engineering staff since last April, becomes branch manager at Rockford, Ill. **Daniel J. Donnelly,** in the Philadelphia office for nearly two years, takes over Drollinger's post in Cincinnati, reporting to **R. A. McDowell,** Cincinnati sales manager. **John M. Duff,** identified since 1947 with many phases of A-c. and D-c. design for Reliance and assigned last fall to the company's Applied Engineering & Industrial Sales Department, now joins the Reliance sales application engineering staff at Boston. **George P. Loomis, Jr.,** who joined Reliance in 1951, takes on sales application engineering duties in Syracuse.

## Sheet and Tube Appointments

**Four men** have stepped up the ladder with The Youngstown Sheet and Tube Company.

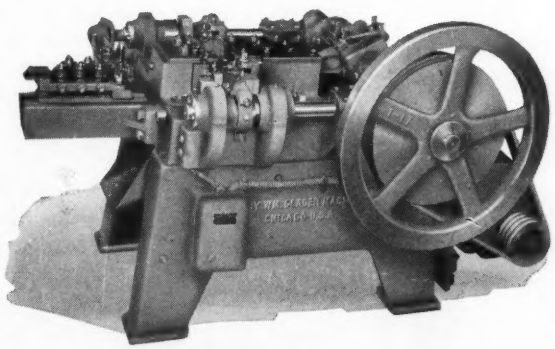
★ ★ ★

**Donald W. Lloyd,** general superintendent of Brier Hill Works here for six years, has been appointed general superintendent of the steel plant at Indiana Harbor, East Chicago, Ind. He succeeds George W. Abel who died recently.

★ ★ ★

**Thomas Bruce Carpenter,** super-


GLADER HIGH SPEED WIRE NAIL MACHINE



MACHINE ARRANGED FOR INDIVIDUAL MOTOR DRIVE

High tonnage output, and low maintenance costs, have resulted in Glader Machines being accepted as standard equipment in every large nail mill built in the United States in the past twenty years.

Glader Machines are operating in most of the wire producing mills throughout the world.

These machines are made in eleven different types and sizes. This enables us to cover the range of sizes of nails produced with the greatest efficiency.

For further information please address,

WM. GLADER MACHINE WORKS
210 No. Racine Ave.
Chicago 7, Illinois

Export Dept.: 122 E. 42nd Street, New York 17, N. Y.

intendent of the open hearth department at the Brier Hill Works, succeeds Lloyd as general superintendent at Brier Hill.

★ ★ ★

**James W. Kirkpatrick,** chief metallurgist in the Youngstown district, succeeds Carpenter as superintendent of the Brier Hill open hearth department.

★ ★ ★

**Ernest B. Plott,** steel plant metallurgist, becomes chief metallurgist in the Youngstown district, succeeding Kirkpatrick.

### To Manage Philadelphia Plant

**Harold E. Kleintop** has been appointed manager of wire product operations at the Philadelphia plant of **Hewitt Robins, Inc.,** of New York, N. Y.

### Pennsalt Names New General Sales Manager

**Albert H. Clem** has been appointed General Sales Manager of the **Pennsylvania Salt Manufacturing Co.,** filling the position left vacant by the recent death of Russell S. Roeller, it has been announced by William P. Drake, Vice President.

★ ★ ★

**Before** this appointment, Mr. Clem was Assistant General Sales Manager. He joined Pennsalt in 1938 following his graduation from the Pennsylvania State College with the degree of Bachelor of Science in Chemical Engineering.

★ ★ ★

**Starting in** the Development Department of the Research and Development Division, he was subsequently a technical sales representative in the Detroit area for the Metal Processing Department; and then, in the same department in Philadelphia, a Product Supervisor, Assistant Sales Manager, and Sales Manager.

★ ★ ★

**He** then became Assistant to the Vice President in charge of Sales; Sales Manager of the Industrial Chemicals Department, and Field Sales Manager in Charge of all district sales offices.

### C. F. & I. Appoints Sales Executive

**The** appointment of **R. L. Hanes** as Assistant to the Vice President in charge of sales was announced by F. S. Jones, Vice President, effective February 15, 1953.

★ ★ ★

**Mr. Hanes** joined CF&I in July 1929. After working in several departments at the Pueblo plant and at the mines, he was transferred to the sales department in 1936.

★ ★ ★

**He** represented the sales department at Wichita, Phoenix and Houston.

★ ★ ★

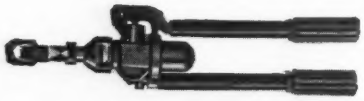
**Following** his return from the Navy in 1945, with the rank of Lt. Commander, he was assigned to the general sales office in Denver and later as District Manager in Fort Worth.

★ ★ ★

**In** April 1949 he was appointed Manager of Wire Product Sales with office in Denver.


# The Right Cutting Tools

## CAN CUT YOUR COSTS, TOO!



MODEL 200-A

**NEW, POWERFUL, HAND OPERATED HYDRAULIC CUTTER**

Cuts ½" reinforcing rod and other comparable materials with ease. Simple hand pump action develops 8500 p.s.i. exerting 10 tons cutting force. Blades easily removed for resharpening. Weight —15 lbs. Length—24".

**MANCO**

**SPECIALIZED CUTTING TOOLS**

**Cut reinforcing rod, chain, bolts, wire rope**

**NEW IN BOLT CUTTERS!**

**Reversible Jaws Give Double Blade Life**

New, exclusive design gives you twice the cutting life from one set of jaws. Handles are *guaranteed against breakage.* Available in 30" size. Capacity, ½" bolts, ⅜" rod. Jaws alone available to fit standard 30" bolt cutters.

MODEL 2 MCC

**PORTABLE HYDRAULIC GUILLOTINE**

Heavy-duty hydraulic cutter provides 22½ tons cutting force yet weighs only 40 lbs. Cuts ¾" reinforcing rod, 1" log chain. Other similar models to cut wire rope. Easy hand pump action. Also available with a variety of power pump units for high speed production cutting.

MODEL 20-A

*See Your Distributor or*

Write **MANCO MFG. CO.,** BRADLEY, ILLINOIS

W4

### Joins Cleveland Welding as President's Engineering Aide

**Russel J. Keller** has joined **Cleveland Welding Company,** subsidiary of **American Machine & Foundry Company,** as engineering assistant to the president, it has been announced by **Morehead Patterson,** AMF board chairman and president.

★ ★ ★

**Mr. Keller** was formerly technical supervisor of the aircraft wheel and brake division of the B. F. Goodrich Company. Located in Cleveland, Ohio, Cleveland Welding Company is one of the nation's major manufacturers of bicycles including the well-known "Roadmaster" brand, demountable steel rims for heavy duty mobile equipment, and other circular welded steel products for the automotive and aircraft industry.

★ ★ ★

As engineering assistant to William A. Sipprell, Jr., Cleveland Welding's president, Mr. Keller will have supervision of all production and development engineering.

### Appointed to New Position by Bristol Brass

**The** appointment of **Joseph T. Hassett** to the newly-created position of assistant general superintendent was announced in February by **Roger E. Gay,** president of the **Bristol Brass Corporation.**

★ ★ ★

**Mr. Hassett** came with Bristol Brass in 1940 and in 1944 was made director of the Time Study and Methods Department. In his new post he will assist **Joseph O'Brien,** vice president and general superintendent of the company, and will continue to supervise the Time Study and Methods Department.

### Manco Appoints Sales Manager

**Jack W. Harvey,** formerly Assistant Sales Manager in charge of the Chicago territory for the **Manco Manufacturing Company** of Bradley, Illinois, has been appointed Sales Manager for the firm according to **B. E. Jasper,** Vice-President. Mr. Harvey will be in charge of the firm's expanding activities in the hydraulic tool field.

### Apex Alkali Appoints Treasurer

**Bernard J. Stuetz,** C.P.A., formerly associated with **Mathieson Aitken & Co.** C.P.A.'s, was recently elected Treasurer and a Director of **Apex Alkali Products Company,** Phila., Pa., a manufacturer of Industrial Cleaning Compounds and Lubricants.

★ ★ ★

**Mr. Stuetz** is a member of the Philadelphia Chapters of the Penna. Institute of C.P.A.'s and the National Association of Cost Accountants. He is a graduate of LaSalle College and resides at 4550 Oakmont Street, Phila., Pa.


*Proven by wide usage—greater efficiency in* **Serving and Braiding** *when packages of* **Silk-Nylon-Acetate** *are the product of our Mills.*

*Producers also of* **Tracer and Marker Trams** *which meet the* **Underwriters' Laboratory** *specifications.*

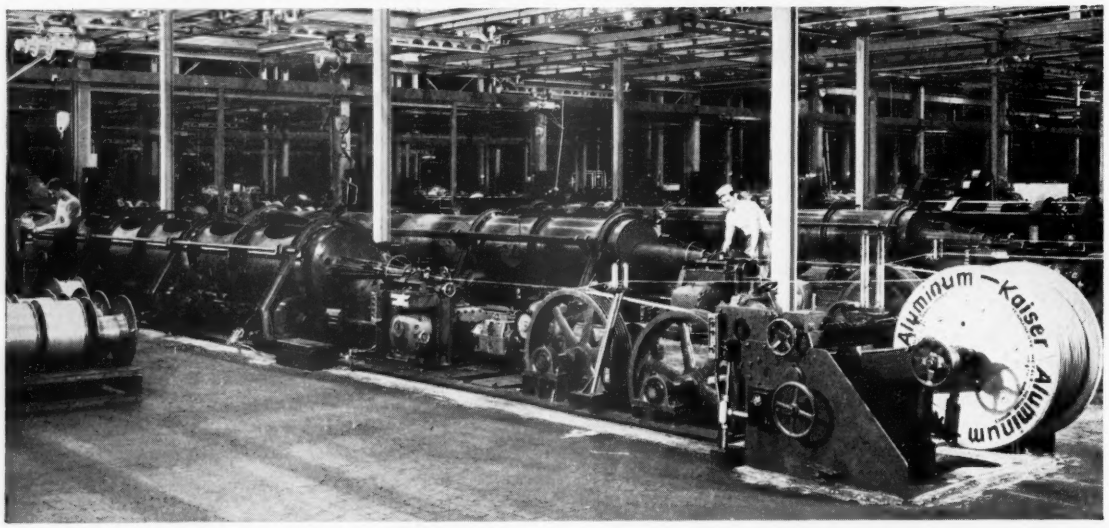
*Consult us on your specific problems.*

**Belding Heminway** *"Over a Century of Leadership"*

**Industrial Yarn Division** **1407 Broadway, New York 18, N. Y.**

## NEW 22" SPOOL 750 RPM TUBULAR STRANDER

HYDRAULIC LIFT REEL STAND — INFINITELY VARIABLE TRAVERSE AIR CONTROLLED
DOUBLE DRUM HAUL-OFF WITH LINK BELT P.I.V. — AIR OPERATED BRAKING SYSTEM

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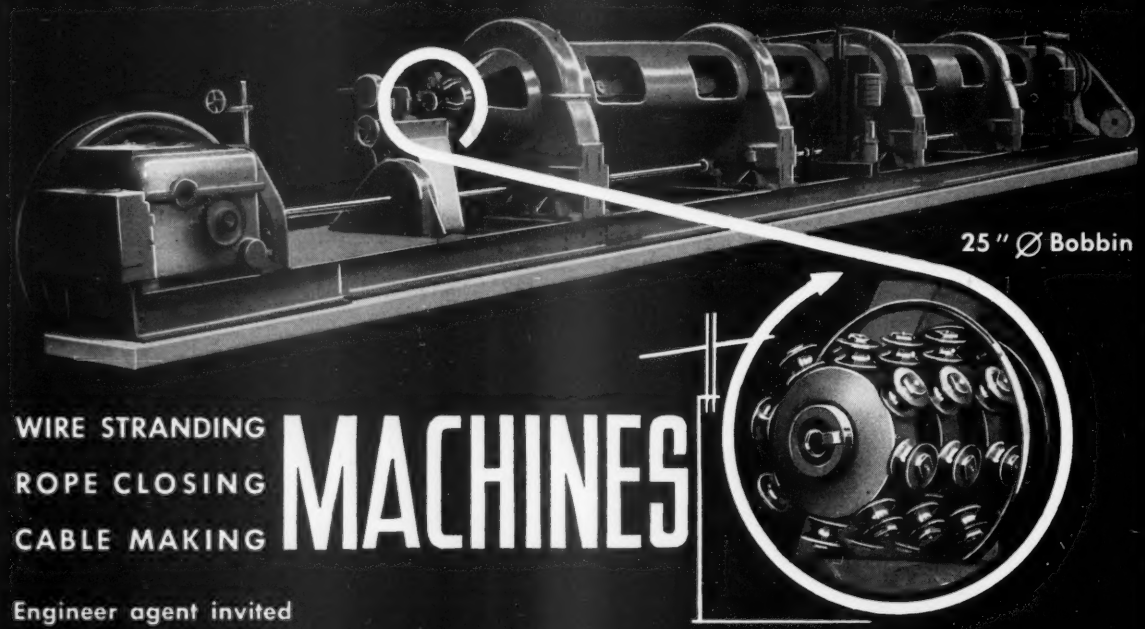
## NIEHAUS High-Speed Tubular Stranding Machine




WIRE STRANDING
ROPE CLOSING
CABLE MAKING

# MACHINES

Engineer agent invited

MASCHINENFABRIK K. A. NIEHAUS · GERMANY
DÜSSELDORF-RATH

## Appointed Surface Combustion Corporation Agents

**The** appointment of **Economy Equipment Company** of St. Louis, Missouri as agents for the sale of standard industrial equipment in the states of Missouri, Kansas, and the southern half of Illinois, is announced by Surface Combustion Corporation, Toledo, Ohio.

★ ★ ★

**With** sales and technical service offices in Kansas City and Wichita, Kansas, as well as St. Louis, Economy Equipment Company is active as manufacturers' representatives for a wide line of equipment, particularly in the power plant field.

★ ★ ★

**Economy Equipment Company** will handle the complete standard industrial equipment line of Surface Combustion Corporation, including furnaces, air heaters and burner equipment.

## Carboloy Sales Executive Returns from Military Service

**Lt. Col. Peter J. Jensen,** manager of the Michigan Sales District for the **Carboloy Department of General Electric Company** in Detroit when he was recalled to extended active duty with the Ordnance Corps, has returned to his former position.

★ ★ ★

**In** April, 1951, Mr. Jensen was assigned to the Detroit Ordnance District. During the past 22 months he has been chief of the weapons branch.

★ ★ ★

**He** is a mechanical engineering graduate from the University of Nebraska and joined the Carboloy Department in 1937 as a tool engineer, after completing a year at Schenectady on General Electric's test course.

★ ★ ★

**From** 1941 to 1946, he served in the Ordnance Department as chief of the small arms branch, Detroit Ordnance District.

## Fidelity Management Realigned

**The Fidelity Machine Company, Inc.,** Philadelphia, manufacturer of specialized equipment for the textile, rubber and wire industries, has announced a realignment of its top executive staff to speed its expansion drive into new markets.

★ ★ ★

**Lawrence Katz,** Chairman of the Board, has assumed active leadership of the company. Though he has headed the Fidelity organization for the past seven years, his work until now has been confined to an advisory rather than a participating nature. The change is being made because of Fidelity's need for day to day coordination of its expanding domestic and foreign activities. The company is faced with a large volume of military work, a healthy demand for its products in the markets now served, and there are several new products about to be introduced in new markets. This has created a pressing need for full scale leadership.

★ ★ ★

**Joseph P. Vogt,** Fidelity president, in addition to his administrative duties as General Manager is assuming charge of all new


NRM

"JOB-DESIGNED" WIRE COVERING EQUIPMENT . . .

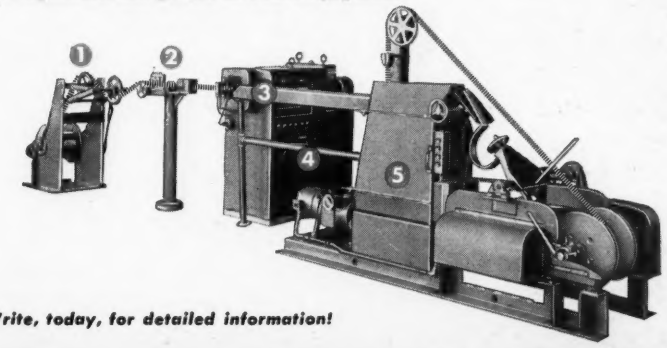
When it comes to covering wire with plastics, you can't beat NRM extruders and their tailormade accessories. For NRM equipment is specifically designed to do an exact job of insulation with any of the wire covering plastics — including Nylon.

Pictured here is the equipment designed to cover wire with vinyls, or polyethylene. With a few simple changes, this same basic machinery can be used with Nylon.

Important features of NRM equipment include rugged electrically heated extruders with built-in "Balanced Heat Control" for exact temperature control; precision-built, alloy steel feed screws with flame hardened flight surfaces designed to eliminate "pulsation"; unique die and front flange assembly for faster die and screen changes and easier "change-overs"; and, supply reels, wire straighteners, wire preheaters, and cooling and take-up units engineered to give a fast, continuous production at close tolerances.

Important, too, are the quality workmanship and years of experience that go into all NRM equipment.

1. Supply Reel Stand
2. Wire Straightener
3. 1½" Electrically Heated Plastics Extruder
4. Cooling Trough
5. Combination Take-Up and Cooling Unit

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General Offices & Engineering Laboratories: Akron 8, Ohio
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Creative Engineering

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## WIRE-WORKING MACHINERY

Wire Netting Machines for Chain Link, Hexagonal Mesh, Poultry Netting, Field Fence. Crimping, Barb Wire and Staple Machines. Spring Coilers. Spring End Grinding Automatics. Loop Benders. Upholstery Spring and Wire Mattress Machines. Wire Nail Machinery. Chain Formers. Chain Welders. Straightening and Cutting Machines. Multi-Slide Wire and Strip Forming Machines. Special Machinery for the making of Paper Clips, Lock Washers, Bale Ties, Key Rings, Tin Openers, Wire Bag Ties, etc. Automatics for Flexible Metallic Tubing.

**Sole Agents for Australia and New Zealand: Bliss & Reels Co. Pty. Ltd., 64-66 Little Bourke Street, Melbourne C. 1, Australia.**

WAFIOS

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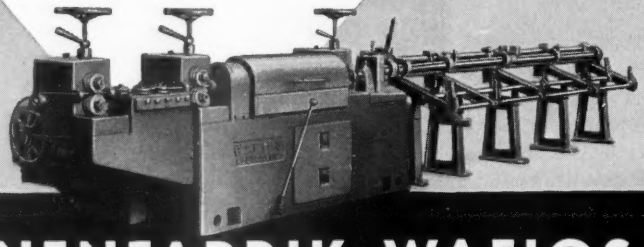

## MASCHINENFABRIK WAFIOS

WAGNER, FICKER & SCHMID **REUTLINGEN 3 / WURTT. GERMANY**

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M R+P

SINCE 1870

*A New Universal Automatic Multi-Slide Bending Machine*

suitable for the fully automatic, economical mass production of all types of components from wire and strip material.

**Special Features:**

- Vertical, enclosed construction, requiring the minimum of floor space.
- Positive and direct control of the bending slide, ensuring high output and trouble-free operation.
- Accurate material infeed by special gripping mechanism.
- Simple tooling, easily adjusted and changed.
- Additional slides for special shapes can be fitted.
- Extra attachments for piercing, blanking and embossing.

Our special leaflet giving details on the range of application of our automatic multi-slide bending machines is available on request.

## MEYER, ROTH + PASTOR

MASCHINENFABRIK G. M. B. H.

KÖLN-RADERBERG / GERMANY

product development and engineering. A newly created Product Development Division has been set up under his direction to seek new patents and inventions which can be successfully marketed and to handle the development of Fidelity's own products.

★ ★ ★

**Roy Faigenbaum,** who was recently made Vice President for Sales, has been named to head the Market Development Division. This division, it was indicated, will study the existing application of Fidelity products in domestic markets and make recommendations of new uses and fields suitable for the company's equipment.

★ ★ ★

**Robert Scholes,** Vice President in charge of Engineering and Production, will have complete supervision of the plant and the constant improvement of engineering and manufacturing methods for both quality and production.

## Personnel Additions and Advancements in American Wheelabrator District Offices

**American Wheelabrator & Equipment Corporation,** Mishawaka, Indiana, has made promotions in and additions to its field sales personnel. The firm manufactures abrasive blasting equipment for cleaning and surfacing metals, deflashing plastics, descaling steel sheet and strip, and dressing cold mill rolls; blast cleaning abrasives for these applications; dust and fume collectors for the chemical and metal-working industries; and sand conditioning equipment for foundries.

★ ★ ★

**K. E. Blessing** has been promoted to the post of district manager of the company's sales office at 53 Newark Street Bldg., Hoboken, N. J. Also announced was the addition of **F. John Pichard** to that office as sales engineer. **David Logan,** sales engineer, and **A. J. Smith,** service engineer, continue in their posts to complete the branch office organization.

★ ★ ★

**George F. Burditt** has been appointed district manager of the company's Pittsburgh office at 91 Central Square, Pittsburgh 28, Pa. **C. E. Andrews,** service engineer, completes the Pittsburgh organization.

★ ★ ★

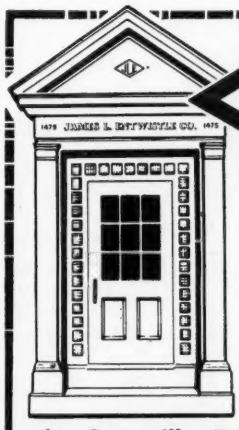
**George C. Tolton** has been appointed district manager of the company's Greensboro, N. C. office at 211 W. Sycamore, Greensboro. Mr. Tolton was formerly in the Seattle, Washington office of the company for more than 6 years. Service Engineer **C. E. Andrews** is assigned to that office.

## Appointed Vice President of Sales

**Harry E. Beane** has been appointed Vice President of Sales of **The Bristol Company,** Waterbury, Conn., manufacturers of automatic controlling, recording, telemetering, and aircraft instruments, and socket screw products, according to an announcement by **William H. Faeth,** President of the Company.

★ ★ ★

**He** joined the Bristol sales engineering organization in 1920 and in 1925 was appointed district

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SERVING THE WIRE INDUSTRY THROUGHOUT THE WORLD

- Caterpillar Pull-outs
- Standard Sets of Spark-Testing Equipment
- Take-ups and Re-spoolers
- Reelers
- Coilers
- Spoolers
- Collapsible Coiling Reels
- Wire Sparkers and Accessories
- Hand Locators
- Electrode Units and Stands
- Measuring Machines, Counters and Accessories
- Wire Guide Units
- Pay-off Reels Stands
- Electronic Devices
- Shaftless Take-ups and Payoffs
- Wire Pre-Heater
- Disk Brakes and Controls, Drag Units and Slip Clutches
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- Labelling Machines
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- Special Machinery for the Wire Industry
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- Cable Handling Equipment for Warehouse Use


See Page 358 for News of JLE Class R Reeler


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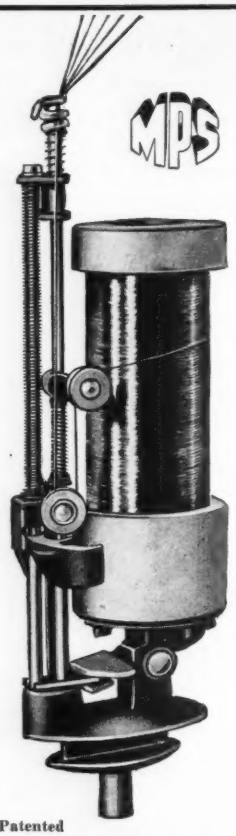


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2 BX - Special
MOSSPEED Carrier.

# MOSSPEED BRAIDER CARRIERS

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## MULTIPLE ENDS OF FINE WIRES

A special design MOSSPEED CARRIER and BOBBIN is supplied for braiding "SHIELDED" WIRE, ETC.

Will braid multiple ends of aluminum, brass, bronze or copper wire, etc.

TWO SHEAVE-WHEELS and SPECIAL-TOP-THREADEYE on carrier, together with new type BOBBIN provides an even wire "let-off" resulting in a high quality and uniform braided shield.

Consult our engineers regarding your braiding problems

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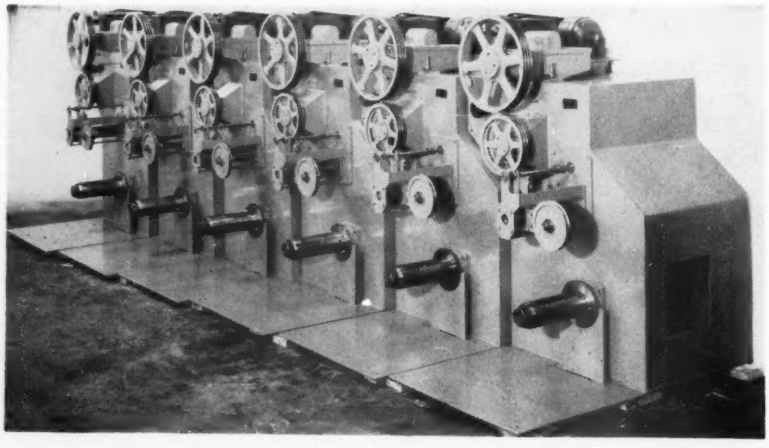


MULTIPLE WIRE TAKE-UP NO. 1049

An assembly of 6 individual units, each reel-arbor torque motor driven. For use in wire tinning outfits, etc.

Constant wire speed by motor driven capstans.
Each traverse adjustable for width and pitch.
Reels held on expanding arbors.
Air ejector for reels.
Welded steel construction.
Ball-bearing mounted throughout.
Capacity — 28 inch reels.

Many other models, including single unit and multiple units, horizontal, vertical, or inclined.
Let-offs with adjustable torque motor or friction tensions.
Spinner let-offs with wire tension adjustable while in operation.

WIRE DRAWING, ENAMELING, TINNING, INSULATING, TAPING, GLASS-COVERING, PANNING, AND ALLIED MACHINERY.

EST. 1855 AIMCO INC. 1915

**"American" AIM INSULATING MACHINERY COMPANY**

REG. U.S. PAT. OFF.

FAIRHILL AND HUNTINGDON STREETS
PHILADELPHIA 33 PENNSYLVANIA U.S.A.

manager of the company's Birmingham, Ala., office. In 1930 he became district manager of the Pittsburgh district.

★ ★ ★

**In** 1943 Mr. Beane was made sales manager of the Instrument Division of the Company and in 1947 promoted to the position of general sales manager.

### Research Men in New Posts

**Dr. Johan Bjorksten,** President of Bjorksten Research Laboratories, Inc., Madison, Wis., announces that **Henry Tovey** has been appointed senior literature chemist in charge of the Washington, D. C. Literature Research Branch of the Bjorksten Research Laboratories.

★ ★ ★

**James W. Perry,** who has been Director of Literature Research with the Bjorksten Research Laboratories, remains in the organization as a consultant, and has been placed in charge of a Government-sponsored program for developing machine methods in searching and correlating scientific information.

### Purnell Retires as Chairman of Sheet and Tube

**Frank Purnell,** chairman of the board of **Youngstown Sheet & Tube Company** and one of the nation's top ranking steel executives is retiring as of April 28th, winding up 51 years service in the industry.

★ ★ ★

**However,** he will continue as a director and a member of the executive board. He also will stay on in an advisory capacity.

★ ★ ★

**Mr. Purnell,** now 66, has been shedding some outside jobs for some time to ease his responsibilities.

★ ★ ★

**He** has been with the company for most of his 51 years and most of the time in executive capacities. Born in Youngstown, October 11, 1886, he started with the company March 17, 1902, as a hall boy. He worked up through various jobs in the order, accounting and sales departments, was with the War Production Administration in World War I, returning to Sheet & Tube in 1923. He became president January 1, 1930, and chairman of the board in 1950, when J. L. Mauthe was named president.

### Transferred to Production Work

**Dick Kellogg** has been transferred by the **Anaconda Wire & Cable Co.** from the sales to the production department. Mr. Kellogg has been assigned to the Marion Mill.

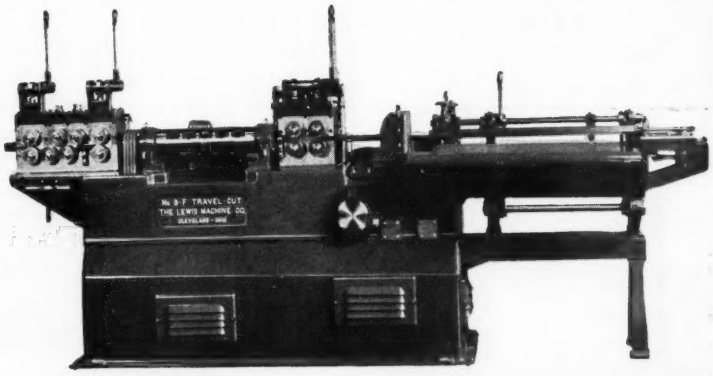
### Irvington Varnish Promotes Brown

**Gordon C. Brown,** formerly sales manager, Fibron (Plastics) Division, **Irvington Varnish & Insulator Co.,** Irvington, N. J., has been promoted to vice president of the company and general manager of the division. He is succeeded by **Bernard M. Hoey** as sales manager.


*Fast, Accurate, Economical*

**STRAIGHTENING and CUTTING**

*with* LEWIS **TRAVEL-CUT**



22 Models to handle from 1/16" to ¾" Round, Hex, Flat, Shapes.

**Simple in design, rigid in construction, Lewis TRAVEL CUT will deliver continuous dependable service under the most severe, high production conditions—day in, day out. Feeds wire from the coil, straightens accurately, gauges to uniform length, and cuts clean without stopping the wire. For steel, brass, aluminum and alloy wire. Cut your cutting costs with the Lewis TRAVEL CUT. Full details on request.**

*Exclusive Representatives*

**EAST:** Penn Machinery Co., 117 North Third Street, Philadelphia 6, Penn.

**MIDDLE WEST:** Steel & Wire Machinery Co., 15457 Euclid Ave., Cleveland 12, O.

**CENTRAL:** Moslo Machinery Co., 2443 Prospect Avenue, Cleveland 15, Ohio.

**WEST COAST:** Hoffman & Heartt, 3065 So. Grand Ave., Los Angeles 7, California.

**CANADIAN:** Empire Engineering Co., 11 Wellington St. E., Toronto 1, Ontario.

**CONTINENTAL EUROPE:** Gaston E. Marbaix Ltd., Devonshire House Vicarage Crescent, London S. W. 11, England.

**The LEWIS MACHINE Company**

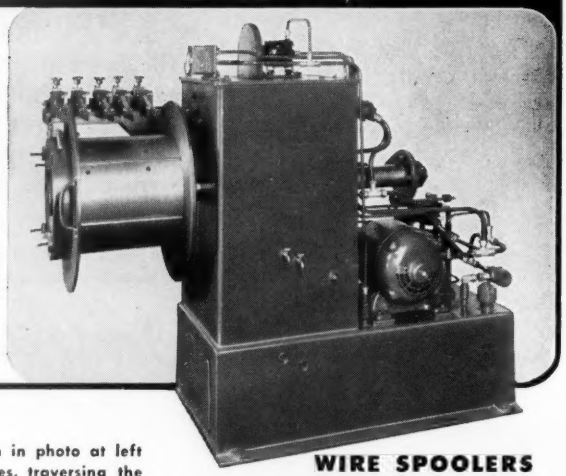
3441 E. 76th Street, Cleveland 27, Ohio

*Also agents in Paris, Stockholm, Rotterdam, Brussels, Zurich, Milan, Bombay and Melbourne*

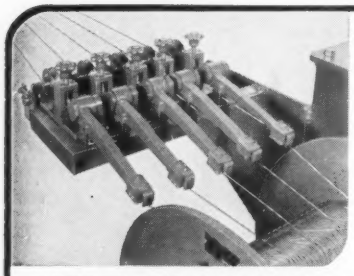
# COIL 5 STRANDS IN 1 OPERATION

**SECO TRAVERSE REEL SPEEDS UP PRODUCTION**

This new SECO Traverse Reel winds five separate coils of flat wire or narrow strip *at the same time.* Coils are oscillated-wound, permitting much longer lengths than conventional ribbon-wound coils. Smooth, powerful hydraulic operation gives coiling speeds as high as desired, accurately controlled from zero to top running speed.



**WIRE SPOOLERS**
Single and Multiple type. Speeds up to 4,000 feet per minute.



Method of coiling is shown in photo at left The complete block oscillates, traversing the wire into five 3" wide coils. Traverse and tension control are extremely accurate. 1/8" to 1/2" wide flat wire can be wound. Block has 16" inside diameter and 24" outside diameter.

*Call or Write for Information and Complete Data — No Obligation*

**STEEL EQUIPMENT CO.** P. O. Box 737, Warrensville Station, Cleveland 22, Ohio

**SECO**

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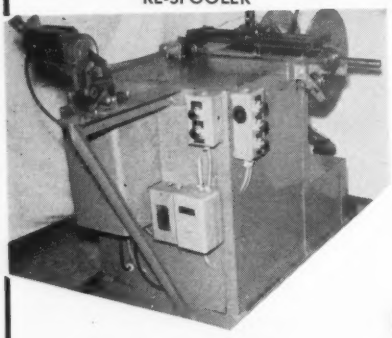
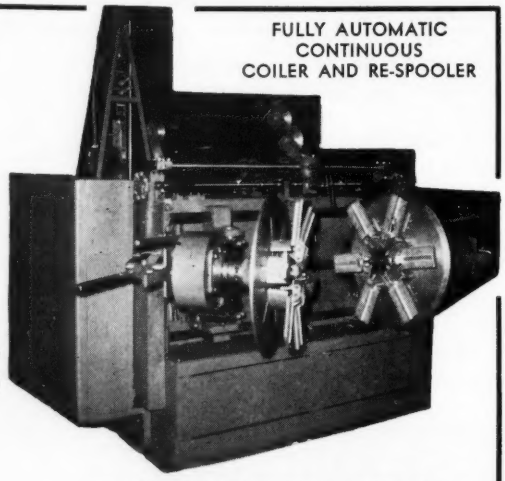
RE-SPOOLER



# TWO RE-SPOOLERS YOU NEED FOR MAXIMUM PRODUCTION EFFICIENCY

**BOTH ARE ELECTRONICALLY CONTROLLED**

FULLY AUTOMATIC CONTINUOUS COILER AND RE-SPOOLER



MACHINE SHOWN ABOVE DOUBLES PRODUCTION

ITS FEATURES ARE:

- VARIABLE SPEED
- CONSTANT FOOTAGE
- AUTOMATIC ACCELERATION
- PUSH BUTTON CONTROL
- ELECTRIC BRAKE
- TRAVERSE GIVES CONSTANT LAY WITHOUT GEAR CHANGES
- RIGHT OR LEFT HAND DESIGN

*Our pattern shop and foundry facilities are available for repair of any type of wire equipment — at very low costs.*

*TRY US!*

THIS MACHINE IS COMPLETE IN EVERY DETAIL:

- ELECTRONIC CONTROLS
- CAPSTAN OPTIONAL
- ELECTRONIC TRAVERSE—THERE ARE NO GEARS
- AUTO RESET PREDETERMINED COUNTER
- ADJUSTABLE COLLAPSIBLE COILING HEADS
- REMOVABLE SHAFTS FOR RE-SPOOLING
- AUTOMATIC CUTTER
- SELF TYING

YOUR INQUIRIES ON THESE ECONOMICAL MACHINES ARE INVITED

## WIRE INSULATING MACHINERY, Inc.

260 TOLLAND TPKE. (TEL: MITCHELL 2-2192) MANCHESTER, CONN.

*"Engineered by men who know the business."*

### Jenter Now Cleveland District Manager

**Harry L. Jenter** has been appointed to the position of district manager of operations for the Cleveland District of **American Steel & Wire Division.**

★ ★ ★

**Mr. Jenter** succeeds Albert J. Hoyt, retired. Mr. Jenter will be concerned with the operations of Wire Division facilities in this area, including Cuyahoga Works, American Works, Central Furnaces and Docks and Coke Works, and Newburgh Works.

★ ★ ★

In 1917 **Mr. Jenter** joined the Wire Division's Trenton Works as a draftsman, and for the next few years alternately worked for the Division and attended college. In 1926 he was graduated from Syracuse University with a degree in mechanical engineering. He then transferred to the Cleveland office and in 1928 was made an assistant foreman at the Cleveland Newburgh Wire Works.

★ ★ ★

**In 1932** he was transferred to the Cleveland Cuyhoga Works cold roll strip department and in 1934 was made a general foreman. He became assistant superintendent of the Works in 1935 and general superintendent in 1939. In 1942 he transferred to the headquarters office as assistant to the vice president of operations. He resumed his post as general superintendent of Cuyahoga Works a year later, and was made chief engineer September 1, 1950.

### Carboloy Veteran Retires

**Vernon H. Dearle,** manager of the Michigan sales district for the **Carboloy Department of General Electric Company** in Detroit will voluntarily retire on June 1 after 24 years of service with the organization.

★ ★ ★

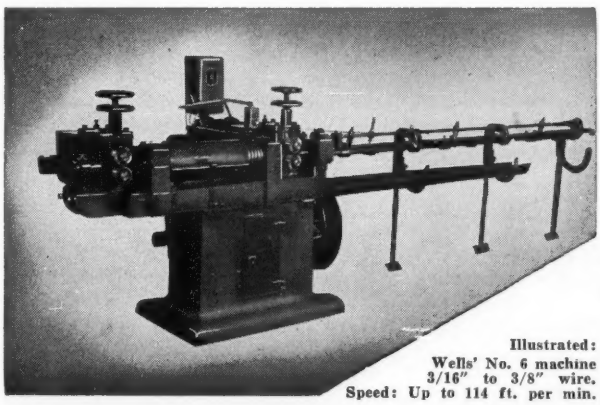
**Mr. Dearle,** the first salesman to be employed by the Department, has been associated with tungsten carbide tools since their introduction in this country. He has been particularly active as a sales engineer, specializing in applications of carbides to automotive manufacture.

### Edward S. Bassett

**Edward S. Bassett,** 83, former President and Director of **Cowles Chemical Company,** died March 9 at his home in Cleveland Heights, Ohio. He was born in New Haven, Connecticut, and had been associated with Cowles since 1918 when he became a Director. In 1926 he was appointed General Manager, and in 1930 was elected President, serving in that office until 1938. At that time he became Chairman of the Board and served until 1941 when he retired from that office but retained his membership on the Board and continued to serve the company as Secretary. The development of Cowles Chemical Company in the detergent field took place under Mr. Basset's leadership.


# STRAIGHTEN and CUT SMALL WIRES

## ON FAST, DEPENDABLE WELLS' AUTOMATIC ROTARY MACHINES



Illustrated: Wells' No. 6 machine 3/16" to 3/8" wire. Speed: Up to 114 ft. per min.

THIS MACHINE WILL CUT wire accurately and fast in any length from 7½" up to 25', but must be ordered for the maximum lengths to be cut.

The straightener flier runs in ball bearings. Has 2 H. P. motor arranged for direct drive. Drive gears are located inside of the base. Illustration shows the flier and drive open to show mechanism.

Furnished with 2 sets of hardened tool steel dies.

***WELLS' machines are backed by 58 years of experience and of constant effort to improve their efficiency.***

***The result for you is a line of straightening and cutting machines that will handle the toughest jobs, day in, day out, year in, year out, with little or no servicing. Customers report uniformly high satisfaction with the operation of their WELLS equipment.***

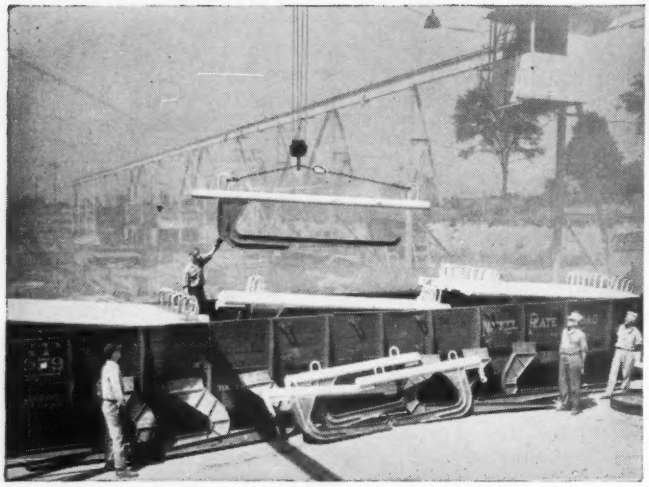
**Built in a complete range of sizes for all wire gauges.**

send for Catalog No. 50 covering the full line.

*Frank L. Wells Company*

**KENOSHA • 5821 Fifth Avenue • WISCONSIN**

***Builders of Fine Wire Working Machinery***



**LIGHTWEIGHT HOOKS *for* HEAVY-DUTY SERVICE**

# WELDCO HAIRPIN HOOKS SPEED UP YOUR PICKLING AND MATERIAL HANDLING OPERATIONS

● Here's another carload of Weldco hairpin hooks, ready for shipment to one of the country's largest steel plants. These pickling hooks are lightweight but tough . . . designed to handle loads as heavy as 3,000 to 5,000 pounds, easily and safely. Weldco hairpin hooks withstand hot pickling acids, too; in fact, they're more corrosion-resistant—more durable—than many heavier hooks.

Weldco pickling hooks are made of Monel, and can be furnished in various other alloys. Put these sturdy, lightweight hooks to work in your plant—then watch your pickling and material handling costs go down.

**OTHER WELDCO PICKLING PRODUCTS**
**Include Pickling Crates, Baskets, Chains, Jets, Scrubbers, and Mechanical Picklers**
*WRITE FOR FREE CATALOGS*

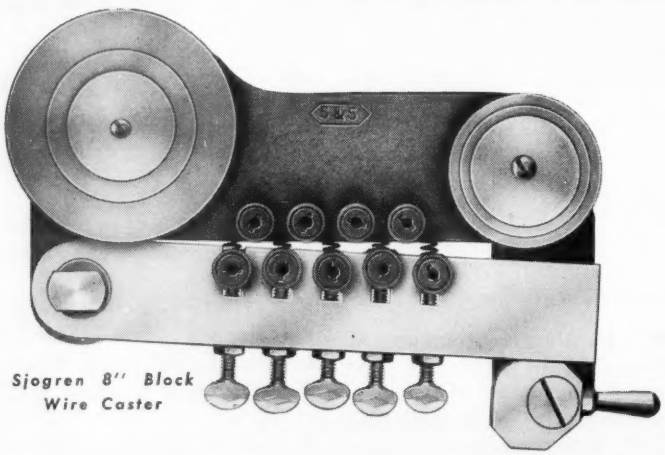
**THE YOUNGSTOWN WELDING & ENGINEERING COMPANY**
3700 OAKWOOD AVENUE . . . . YOUNGSTOWN 9, OHIO

# *Sjogren* KILLERS for Casting Wire

SJOGREN Killers are designed for the job—that of 'casting' wire properly. The 8" block size will handle from .005" to .020" diameters. Other Sjogren killers for larger wire gauges and blocks of greater diameter, having either clockwise or counter clockwise rotation, are made to order.

***Used by Wire Men Who Want the Best!***

SINCE S&S 1927



*Sjogren 8" Block Wire Caster*

WIRE PULLERS • WEDGE GRIPS • JAWS FOR ALL MAKES OF PULLERS AND TESTING MACHINES • CAGE ROLLERS • SWAGING HAMMERS • POINTING DIES • WIRE SPOOLERS

**SJOGREN TOOL AND MACHINE CO., INC.**
Tools for The Wire Industries
**14 SWORD STREET, AUBURN, MASSACHUSETTS**
Represented in Canada by THE LARSON CO., 98 Wellington St., West, Toronto, Ont.

# A Review of Recent Wire Patents

No. 2,627,095, WIRE SPRING CLIP, patented February 3, 1953 by Jose' Atilio Palmieri, Cordoba, Argentina.

The clip formed wholly of bent wire is for use as a clothespin.

★ ★ ★

No. 2,627,381. WINDING TAKE-UP MECHANISM, patented February 3, 1953 for Willy Borberg, North White Plains, N. Y., assignor to International Projector Corporation, Bloomfield, N. J., a corporation of Delaware.

This is a take-up mechanism for a gravity-controlled coil winding machine. There are fourteen claims.

★ ★ ★

No. 2,627,474, RUST PREVENTATIVE COMPOSITIONS CONTAINING A WAX-SOAP BASE, patented February 3, 1953 by Joseph W. Roomberg, Port Neches, Tex., assignor to The Texas Company, New York, N. Y., a corporation of Delaware.

The compositions are adapted as quick-drying liquids for application to metal surfaces to provide a non-tacky adherent film.

★ ★ ★

No. 2,627,778, SCREW AND CAP, patented February 10, 1953 by Frederick G. Hodell, Gates Mills, Ohio, assignor to The National Screw & Manufacturing Company, Cleveland, Ohio, a corporation of Ohio.

A screw is provided with a head having an axial recess therein for the reception of a driver, the recess having a generally square entrance with the sides thereof sloping inwardly axially of the screw and having the intermediate portions thereof projecting inwardly transversely of the axis of the screw, these intermediate portions being undercut to form outwardly sloping abutments facing the inner end of the recess and adapted to be engaged by laterally projecting end portions of prongs on a cap for covering the head inserted into the recess.

★ ★ ★

No. 2,628,040, APPARATUS FOR HANDLING COILS OF STRAND MATERIAL, patented February 10, 1953 by Vincent A. Rayburn, Baltimore, Md., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York.

In this apparatus provision is made for the coil being clamped between the flanges of the drum with sufficient force to prevent the strand material in the outer convolutions of the coil from forcing inbetween the convolutions of the inner layers of the material when the material is withdrawn from the coil.

★ ★ ★

No. 2,628,642, METHOD OF MAKING WIRE LATH, patented February 17, 1953 by Raymond F. Stockton, Sunland, Calif., assignor to Ray F. Stockton Wire Products Co., Inc., Burbank, Calif., a corporation of California.

The method comprises feeding a pair of wires along and in parellel side by side relationship, holding them stationary at a first point, confining them together at a second point spaced in advance of the first point while moving the portions of wires forwardly of the second point toward the first point and simultaneously moving the portions of the wires between the points outwardly with respect to one another to permanently deform the wire and form convolutes or sinuosities in them, then releasing the wires at the first point and moving them forward while causing portions of the wires forwardly of the first point to overlap, and spot welding the overlapped portions together.

★ ★ ★

No. 2,628,714, COIL CONTAINER, patented February 17, 1953 by Frederick R. Schaefer, Youngstown, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio, a corporation of New Jersey.

A sheet metal container for coiled wire is provided and from which the wire may be withdrawn from an end thereof.

★ ★ ★

No. 2,628,936, METHOD OF FORMING A POINT AT THE END OF A WIRE, patented February 17, 1953 by Vincent J. Albano, Fanwood, N. J., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York.

(*Please turn to page* 418)

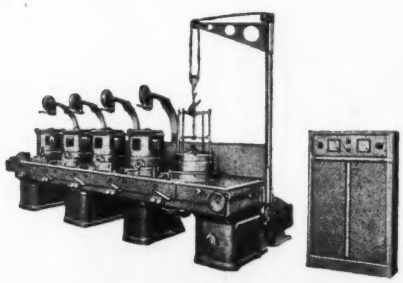
EW

*Wire Drawing Machines,* working on the dry or wet method (soap powder or by immersion) for iron, steel, copper, aluminum and other metal wires.

*Metal Wire Cloth Weaving Looms* (fly & mosquito nets, sieves, plastering work, etc.)

*Automatic Straightening and Cutting Machines*

*Machines for producing*: Wire nails and wire tacks, rivets, iron & wood screws, small nuts, welded and non-welded chains, knotted chains, barbed wire, wire pins, safety pins, hair clips, spokes and nipples for bicycles, etc.

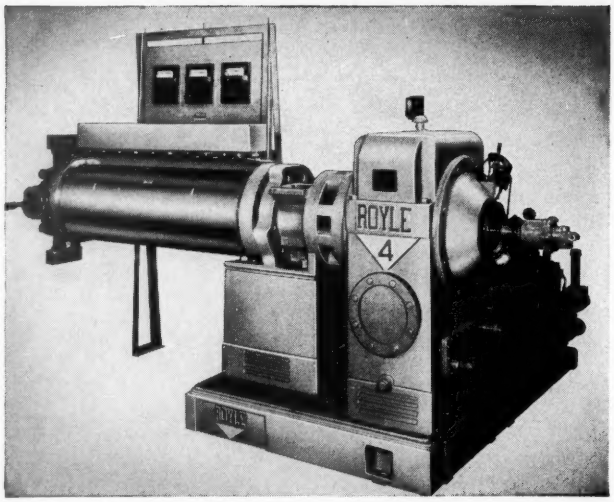


**EMILIO WARTENWEILER,**

**MILAN (Italy), Via Pergolesi, 18.**

**Tel. 21 245**

# ROYLE
## SPIROD* EXTRUDERS




Built by America's oldest builders of extruding machines Royle Spirod extruders are the result of more than seventy years experience in the design of extruding machines. Time tested and proven features are built into Royle Spirod extruders to assure maximum productivity at minimum operating cost. These features include: Heavy steel members without flanges . . . Spirally installed rod type heating elements to provide faster, steadier, more evenly distributed heat . . . Complete insulation of cylinder and head to reduce heat loss with substantial power savings . . . Separate heating zones controlled by proportioning instruments.

**CHECK THESE FEATURES** that assure profitable and trouble-free production of such items as plastic insulated wire, flexible and rigid pipe, plastic sheeting, plastic clothes line, to mention a few of the products that are produced daily with Royle Spirod extruders.

*Patent Applied for

**JOHN ROYLE & SONS**

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

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JEfferson 3264

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H. M. Royal, Inc.
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**PATERSON 3, NEW JERSEY**

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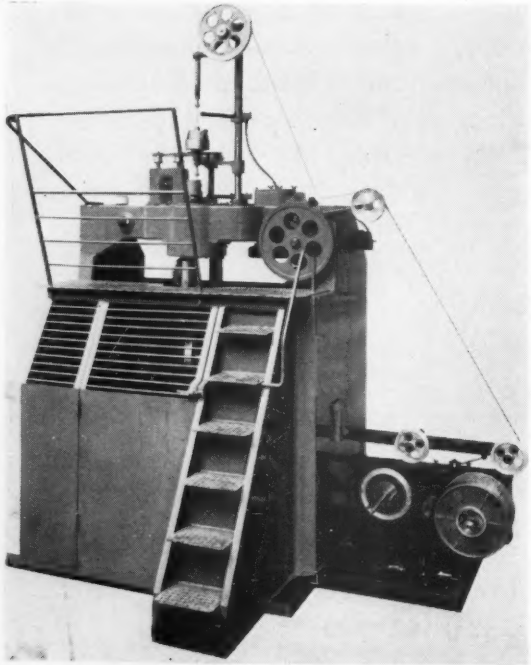
*A New Machine . . .*

## THE POURTIER QUADDING MACHINE



- 2 lays per rotation of the flyer
- Special balancing capacity device
- Automatic stop motion in case of breakage of paper or cotton, on a predeterminated length
- Compensator device controlling the unrolling of the feed-drums and the equality of the four ends
- Double take-up: compensator motion controlling the tension of the quad. Transversal movement of the reels instead of traverse
- Lays easy to reverse and to adjust
- Lockheed braked
- Automatic central lubrication
- Able to be used as a twinner
- Production: 500 lays per minute
- Feed-drums: maximum 16"
- Take-up reels: Maximum 18"
- Lays: from 1 to 7 lays per foot

**POURTIER MACHINES**

153, rue Gallieni, ROMAINVILLE (Seine) FRANCE

## Cleaning Compounds for Electroplating

**The** cleaning problems that confront the electroplating industry and suggested methods of treatment and solution of those problems are thoroughly and concisely covered in a new booklet issued by **Magnuson Products Corporation.**

★ ★ ★

**A new** booklet on the subject, easy to read and having a comprehensive cross-index, delves into job definitions, job requirements and the considerations necessary in choosing the proper cleaning materials for the job at hand.

★ ★ ★

**In** addition, safety notes, operating practices and conversion factors and formulas enhance the value to all engaged in electroplating.

★ ★ ★

"Permag Cleaning Compounds For Electroplaters," as this new publication is titled, covers specifically such main fields as non-electrolytic cleaning, soap pre-soaks, electrolytic cleaning, barrel tumbling, aluminum processing and paint stripping. Listed also are a number of Permag compounds, many of which have been used successfully for over a quarter of a century.

★ ★ ★

**This** booklet is in a handy pocket and index card file size and is available upon request from Magnuson Products Corporation, 50 Court Street, Brooklyn 1, N. Y., and its sales offices and representatives.

## Advanced by Chain Belt

**Chain Belt Company** of Milwaukee announces the appointment of **Gilbert J. Schuelke** as Assistant Sales Manager of its Chain and Transmission Division.

★ ★ ★

**Mr. Schuelke** started with Chain Belt Company in 1936 as an engineering apprentice. He served in various engineering and sales assignments in the company's Milwaukee works, and in its District Sales offices in Atlanta and Milwaukee. He attended the University of Wisconsin, Milwaukee State Teachers College and the University of West Virginia.

★ ★ ★

**This Company** is one of the leading manufacturers of sprocket chains, conveyors and process equipment, and construction machinery. Its products are marketed under the trade names of Rex and Baldwin-Rex.

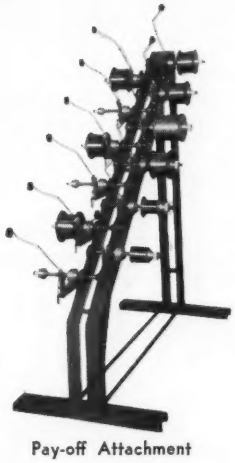
## Elected Treasurer of Chain Belt

**F. Dier Tincknell** was elected treasurer of **Chain Belt Company,** it was announced by **J. C. Merwin,** President. He succeeds George M. Dyke who has retired as treasurer after thirty years of service with the company. Tincknell has been identified with its division of finance and accounts since joining the firm in 1943 and was assistant treasurer prior to his recent election.

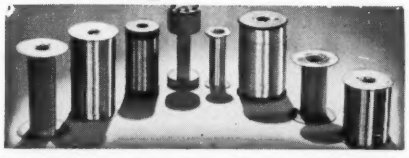

STANDARD UNI-DRIVE WIRE WINDER

INCREASE YOUR PRODUCTION WITH THIS WINDER

Wire Winder



Pay-off Attachment



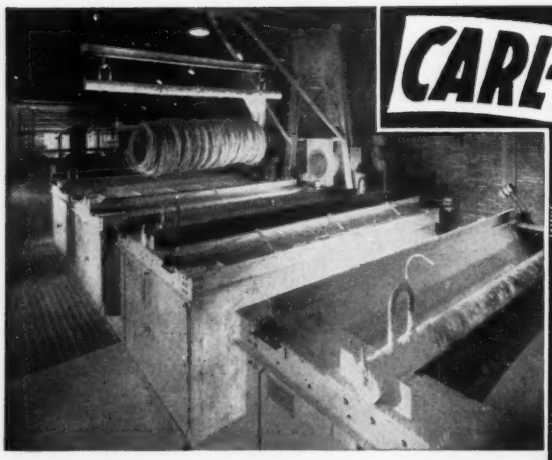
Various types of supply packages that may be wound on Standard Uni-Drive Wire Winder.

PAYOFF

Our payoff attachment is made with self-aligning ball bearings and a compensating attachment to control the tension of each end. Applies same tension when spool is empty as when full.

The new Uni-Drive Winder with Payoff Attachment is new in design and incorporates several improved and tested features. Production is stepped up through increased speed. It produces smooth, even and accurately wound spools of wire in single or multiple ends. All strands parallel—no over or under-winding. Automatic Stop-Motion controls each strand. Compensating attachment produces perfectly controlled tension. Traverse adjustable from 1¾" to 5½" between spool heads without changing cam. Designed especially for winding wire to be braided and shielded for electrical conductors up to ¾" diameter.
Payoff can be equipped with Carboloy Guide Inserts at additional cost.

STANDARD MILL SUPPLY
PAWTUCKET, R.I., 1064-1080 Main St.
NEW YORK, N.Y., 6708 Empire State Bldg.
CHARLOTTE, N. C., 2319 Hutchison Ave.



CARL-MAYER

HI-SPEED REGISTERED

ROD BAKERS

PATENT Nos.
U.S.A.
2,235,559
2,296,361
2,323,828
CANADA
396,144
401,589

**GREATER SPEED AND FUEL ECONOMY PROVES OUTSTANDING ENGINEERING**

Carl-Mayer Hi-Speed Rod Bakers have an exclusive heating arrangement, combining faster baking with amazing fuel economy—and a patented Blow-Off feature which removes moisture without bumping or agitating the coils. *WRITE FOR BULLETIN NO. 350.*

ALSO OTHER TYPES OF INDUSTRIAL OVENS AND FURNACES

*SERVING CONCERNS LIKE THESE:*

American Steel & Wire Co.
Atlantic Wire Co.
Atlas Steel Co.
Atlas Tack Corp.
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Canadian Steel Corporation.
California Wire Cloth Corp.
Colorado Fuel & Iron Corp.
Crucible Steel Co. of America
Eaton Manufacturing Co.
Frost Steel & Wire Co., Ltd.
B. Greening Wire Co., Ltd.
Gary Screw & Bolt Division of Pittsburgh Screw & Bolt Corp.
Hollup Corp.
Indiana Steel & Wire Co.
Johnson & Nephew, Ltd.
Jones & Laughlin Steel Corp.
Page Steel & Wire Co.
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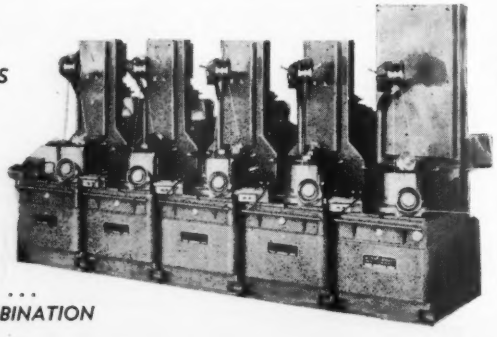
**THE CARL-MAYER CORPORATION**

3030 EUCLID AVENUE
CLEVELAND, OHIO

**AETNA-STANDARD WIRE DRAWING UNIT**

- DESIGNED FOR COMPLETE VERSATILITY
- BUILT FOR SAFE, EFFICIENT PRODUCTION
- SINGLE OR MULTI-DRAFT OPERATION
- INTERCHANGEABLE UNITS AND PARTS
- AUTO-RHEOSTATIC SYNCHRONIZATION
- WATER COOLED BLOCKS AND DIES

*FERROUS OR NON-FERROUS*



*WET OR DRY LUBRICANTS*

*SINGLE UNIT ... OR ANY COMBINATION*

**THE AETNA-STANDARD ENGINEERING CO.**

PITTSBURGH, PA.

*ASSOCIATED COMPANIES:* HEAD, WRIGHTSON & COMPANY, LTD., THORNABY-ON-TEES, ENGLAND
AETNA-STANDARD ENGINEERING COMPANY, LTD. . . . . TORONTO, ONTARIO, CANADA


## New 30 H.P. Horizontal Varidrive

**Varidrive Motors** are now available in horizontal assembly up to 30 HP through the addition of a new horizontal frame size—64 VE. This development of U. S. Electrical Motors Inc. makes possible a more compact motor installation in applications demanding horizontal assemblies.

★ ★ ★

**The** 64 VE possesses all the plus features of the upright 64 Varidrive including all-in-one construction (motor, variable speed transmission and gearing when necessary), microspeed control and indicator, splined Varidisc sheaves, double cog Varibelts with Autotaut tension control for permanent belt adjustment, dual belt construction, asbestos-protected motor and normalized castings. This Varidrive is also available in combination with the U. S. Syncrogear with either single or double reduction gearing.

★ ★ ★

**Varidrive** motors are offered in ratings from ¼ to 50 HP with speed variations up to 10:1. Speeds from 2 to 10,000 rpm. For 16-page full-color bulletin describing Varidrive Motors, write to U. S. Electrical Motors Inc., Box 2058, Terminal Annex, Los Angeles 54, California.

## Specifications for Brazing Filler Metal

**Issuance** of the Specifications for Brazing Filler Metal brings the total in the series of filler metal specifications issued to date to eight. These new specifications are especially important because they cover a field which has grown by leaps and bounds and has not heretofore been covered by specifications, except for a few specific materials.

★ ★ ★

**The** Brazing Filler Metal Specifications cover every type of brazing filler metal in common use today. The 33 different classifications are divided into groups according to the principal constituents. They include classifications for aluminum-silicon; copper-phosphorous; silver; copper-gold; cop-

per and copper-zinc; magnesium; and heat-resisting filler metals.

★ ★ ★

**The** Specifications include an appendix giving helpful information for the selection of the brazing filler metal best suited for a given application. Among the factors included are the brazing temperature range for each classification, the color of the joint obtained, recommended joint designs and an explanation of some of the fundamental concepts of brazing which have previously been misunderstood.

★ ★ ★

**Copies** of the Specifications for Brazing Filler Metal can be obtained, at 40 cents each, from the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.

## Sheet and Tube Again Gets Award

**For** the third straight year **The Youngstown Sheet and Tube Company** has been awarded a George Washington Honor Medal by Freedoms Foundation of Valley Forge, Pa., for its employee publication "The BULLETIN." The award was among others announced at Valley Forge on February 22nd.

## Bakelite Building New Plant to Produce More Resins

**A new** plant for expanded production of Bakelite fluorothene resins—a plastic that resists heat up to 400 deg. F. and withstands fuming nitric acid—is under construction at South Charleston, W. Va.

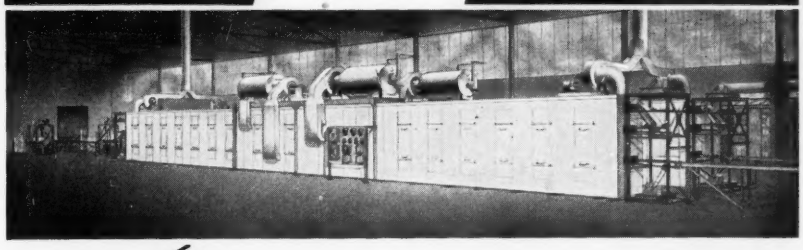
★ ★ ★

**H. S. Bunn,** President of **Bakelite Company,** a Division of Union Carbide and Carbon Corporation, announces this continuous process plant is expected to be completed by the middle of 1953. The new plant is being constructed and will be operated by Carbide and Carbon Chemicals Company, also a Division of Union Carbide and Carbon Corporation. Bakelite Company will handle the sales of fluorothene resins.

★ ★ ★


CARL-MAYER WELDING ROD OVENS

PATENT NOS. 1,843,430 2,373,325



*One of Several Carl-Mayer Ovens at Hollup Corp.*

**FAST, EFFICIENT AND ECONOMICAL DRYING OF COATED WELDING RODS.**

Only in Carl-Mayer Ovens can you obtain the combination of the recirculating gas fired air heater principle and the "Mayer" patented rod transfer system — two highly important features in ovens of this type.

We also build other types of industrial ovens and furnaces. Carl-Mayer installations are backed by reputation for unusual performance, and over 30 years' experience.

*WRITE FOR BULLETIN NO. 350*

**THE CARL-MAYER CORPORATION**

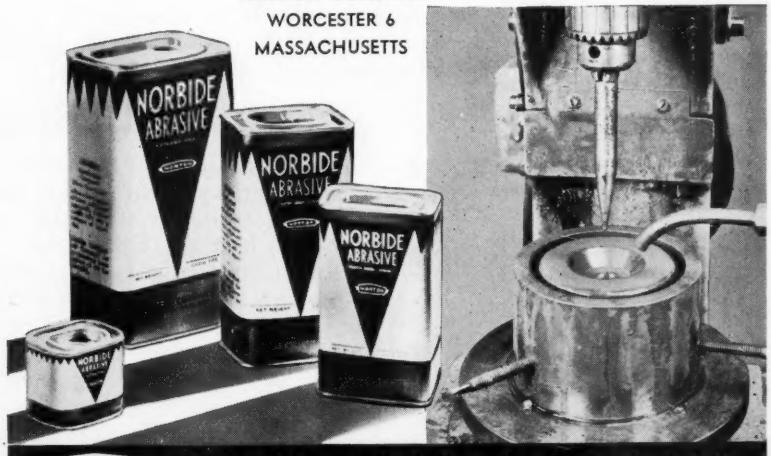
3030 EUCLID AVENUE
CLEVELAND, OHIO

**NORBIDE® Abrasive**

*The Hardest Manufactured Abrasive for Cutting and Polishing Dies*

Highly satisfactory is Norbide Abrasive for ripping this large die. Fed from nozzle (right). A real economy in your die cutting department—second only to the diamond in hardness. Catalog 559-W.

NORTON COMPANY
WORCESTER 6
MASSACHUSETTS




NORTON® *Making better products to make other products better*

# Save Time

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**. . . specify**

**Apco Mossberg Steel Reels, Spools and Bobbins first!**

Profit from fifty years of Apco Mossberg experience and technical skill in providing copper wire, steel wire and wire rope manufacturers with top quality steel reels, spools and bobbins — investigate the complete Apco Mossberg line today. Apco Mossberg reels, spools and bobbins are available in all sizes and types (single heads, double heads) for every purpose. Write now for complete details . . . get your free copy of the Apco Mossberg Steel Reel Booklet. Apco Mossberg Co., Lamb Street, Attleboro, Mass.

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APCO MOSSBERG CO.
ATTLEBORO, MASS.

**The original Frank Mossberg Co.**


**A relative** newcomer to the plastics industry, fluorothene has already indicated it has a large potential for special application in many major industries because of its unique high-temperature and chemical-resistant properties. The value of this new plastic material for special end use such as in electric wire insulation for high-temperature operation, radio tube sockets, printed circuits, battery cases and separators, valve seats, diaphragms and gaskets has been explored experimentally and proved successful. Such applications and the exceptional properties of fluorothene plastics have generated widespread interest in the chemical processing, electric power, electronic, packaging, textile, medical supply, radio and television industries.

★ ★ ★

**A constantly** increasing demand is anticipated for use of the new plastic in special applications in spite of its initially high market price. At present the price per pound for fluorothene is about the highest known for a commercially available plastic—ranging from $11 to $15 per pound in ton quantities up to $17.45 for a single pound.

★ ★ ★

**Three** years of intensive, independent research by Bakelite Company in its laboratories and pilot plant has resulted in the accumulation of wide and basic knowledge about the manufacturing and processing of fluorothene resins. This valuable technical information will be available to fabricators using Bakelite fluorothene resins in new and special applications.

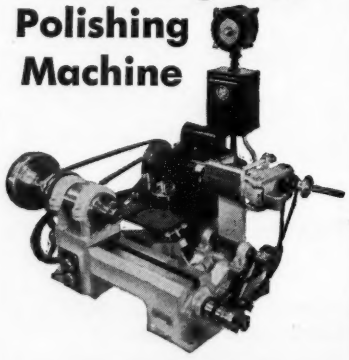
## Booklet on Vinylite Resin VMCH

**The** latest technical information on specifications, formulations and uses of Vinylite Resin VMCH as a surface coating is presented in Technical Release No. 12, a new 16-page booklet published by **Bakelite Company,** a Division of Union Carbide and Carbon Corporation.

★ ★ ★

**Addition** of plasticizers, stabilizers and solvents and their effects on resin VMCH are discussed in


**DOUBLE**
**Your Finished Tungsten Carbide**
***Die***
**Production**
**WITH**
**THE**
**SAME**
**Labor Costs**
•
***The New***
**TYPE 'M'**
**DYKREX**
**Finishing and Polishing Machine**



**Automatic timed Split-second operation from automatic to hand finishing**

***Start Saving Today!***

**DYKREX**
"IT CORRECTS THE DIE"

*Write for full information*
***ROOS TOOL & MFG. DIVISION***
**DYKREX CORPORATION OF AMERICA**
**33-35 Bloomfield Ave., Newark 4, N. J.**

BUNCHING
(TWISTING)
AND
STRANDING
IN THE WIRE AND
GENERAL MANUFACTURING
PROCESSES

SPECIALIZED
ENGINEERING
AND
SPECIALIZED
FACILITIES
AT YOUR SERVICE

Expanding application of twisting principles to the production of many products is reflected by an ever-increasing demand for both H-D standard equipment as well as machines especially engineered to solve varied production problems. Week after week surprising new uses are developed through the close cooperation of our engineering department with manufacturers in many fields.

Write today for our New Technical Bulletins. Tell us what you make—or contemplate making and your inquiry will receive prompt attention.

HASKELL-DAWES
MACHINE CO., INC.
2231 E. ONTARIO ST.
PHILADELPHIA 34
PA.

the pamphlet. Resin VMCH itself is suggested for use as a blending agent to impart improved adhesion characteristics to other vinyl chloride-acetate resins. The booklet outlines proper methods of selecting and using pigments with regard to reactivity, dispersion, and mixing of these colorants with the resin. Several applications of Vinylite Resin VMCH are also described in Technical Release No. 12.

★ ★ ★

**Copies of** this booklet may be obtained by writing to Don Masson, Bakelite Company, a Division of Union Carbide and Carbon Corporation, 300 Madison Avenue, New York 17, N. Y.

### Batch Production Hardening Furnaces

**Gas-fired**, batch type hardening furnaces are featured in a new illustrated bulletin just released by Surface Combustion Corporation, Toledo, Ohio.

★ ★ ★

**Direct-fired,** horizontal hearth types and circular and rectangular salt pot types are included. Also, shown is a complete line of controlled atmosphere equipment for hardening. This includes individual prepared atmosphere generators, horizontal and vertical muffle furnaces, and the new "Allcase" high production furnace incorporating radiant tubes, recirculating fan and a totally enclosed oil quench.

★ ★ ★

**Copies** of bulletin SC-161 are available direct from Advertising Department, **Surface Combustion Corporation,** Toledo 1, Ohio.

### New Plastic Tape Solves Many Labeling Problems

**Shelves,** bins and drawers for tools, dies, parts, inventory and raw stock have always presented a labeling problem, as have many of the items stored. Card and paper labels become quickly soiled and hard to read. Gummed labels, as a rule, do not adhere well to many materials and finishes. If

S. A. ETECO
ZWEVEGEM
(BELGIUM)
Selling Office for
Tréfileries León Bekaert,
S.P.R.L.

STEEL WIRES

IF YOU REQUIRE

NO CMP REQUIRED
*Submit your*
*SPECIFICATIONS*
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J. GERBER & CO., INC.
855 Avenue of Americas
NEW YORK 1, N. Y.

FORMING FACTS

72% SAVING IN METAL!

80% INCREASE IN PRODUCTION!

UNIQUE BALANCE CO., INC.

typical results by every user of

NILSON 4-SLIDE

Wire and Ribbon Metal

FORMING MACHINES

You, too, can enjoy tremendous economies **at once.** NILSON combination press and 4-slide forming machines take the stock directly from the coil — feed, straighten, pierce, blank, swage, stamp, coin — perform up to 5 forming operations and cut off . . . all in one quick, precise operation AUTOMATICALLY!

USING A NILSON COMBINATION PRESS AND 4-SLIDE FORMING MACHINE,

Unique Balance Co., Inc. (one of the largest manufacturers of sash balance equipment), now produces 71,532 more parts out of the same amount of steel, compared to their former method. Production speeds increased from 100 to 180 pieces per minute.

*For specific recommendations, send prints or samples of your operation when requesting bulletin.*

THERE'S NOTHING LIKE A NILSON

THE A. H. NILSON MACHINE CO.
1516 Railroad Ave., Bridgeport, Conn.

Automatic Chain-Making Machines • Automatic Staple Forming Machines • Wire and Stock Reels • Foot Presses • Wire Straightening Equipment • Slide Feeds for Presses

they fall off, endless confusion and lost time result.

* * *

**An** entirely new kind of plastic labeling tape has been developed which solves this labeling problem perfectly. The new tape, known as "Labelon," is of the so-called "pressure-sensitive" type and sticks without moistening to any smooth, dry and reasonably clean surface. Labelon can be written on without ink, pencil or crayon—all that is needed is a sharp point. A pencil is ideal, and usually the handiest, but a stylus is perfectly satisfactory and even a nail will serve in a pinch. Comes in a variety of colors for identification purposes.

* * *

**Please** write to Labelon Tape Co., 450 Atlantic Ave., Rochester 9, N. Y., for further information.

## Carboloy Operating Mobile Educational Program

**Through** the facilities of its weekly customer training school, the **Carboloy Department of General Electric Company** in Detroit operates a mobile extension training and educational program on its tungsten carbide cutting tools that, in some respects, rivals those conducted by the nation's universities.

* * *

**Using its** field men and service engineers as instructors, the Department conducts an average of 10 classes per month in practically every industrial state of the nation. Some of the sessions run as long as four days and involve lectures, visual training aids and "do-it-yourself" classes.

* * *

**Although** a majority of the field training sessions are held right in the plants of users of tungsten carbide cutting tools, a trend was set late last year in several Eastern Pennsylvania cities that may well establish a new national educational pattern.

* * *

**Realizing that** some means was necessary to evaluate technological

BORAX

COATS STEEL RODS WITH JUST ONE DIP!

Check The Advantages Borax Offers:

✓ BETTER WORKING CONDITIONS
*Borax is clean, dust-free, nonflaking*

✓ FASTER BUTT WELDING
*Borax is a natural flux—butts are ready*

✓ FASTER ACID NEUTRALIZING
*Borax is an effective mild alkali*

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*Borax is protection against rust*

✓ SPEEDIER PRODUCTION
*Borax film is tight, pliable, nonflaking*

✓ LONGER DIE LIFE
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MANUFACTURERS OF FAMOUS "20 MULE TEAM" PACKAGE PRODUCTS

HAVING TROUBLE WITH LIGHT WEIGHT REELS FAILING IN HEAVY DUTY SERVICE?

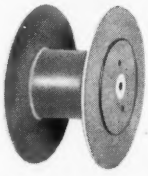
MILTON MACHINE offers you

A SOLUTION TO YOUR PROBLEM that'll save on replacement and maintenance!

RUGGED STEEL
HEAVY DUTY PROCESSING REELS

HEAVY DUTY REEL
Designed for the heavy duty service of a wire rope manufacturer. Flanges with rope brake rim grooves are heavily ribbed semi-steel castings.

WELDED STEEL REEL
Made to wire rope mill's specification to replace light weight pressed steel reels that failed in heavy duty service.



SOLID STEEL PROCESSING SPOOLS & BOBBINS

WRITE FOR BULLETIN 52-W
Your inquiries are invited . . . write or phone, our field engineer-representative will be glad to describe our facilities.

MILTON MACHINE WORKS, Inc.
DESIGNERS — ENGINEERS — MANUFACTURERS
MILTON • PENNA.

advances, industrial education directors of public schools sponsored a series of meetings or clinics for management and personnel of manufacturing plants in their respective areas.

★ ★ ★

**The** Borough School District of Kingston, Pa., with the aid of Department engineers, pioneered the program by setting up a night-school clinic for adults employed in local industries who wanted to know more about the tools and products used and produced in their daily jobs.

★ ★ ★

**Thirty-six** manufacturers in the Kingston area took part in the program which involved two classes an evening. A series of educational films supplied by Carboloy Department was used to present the story of cemented carbides to nearly 200 men. Similar clinics followed in Hazelton, Scranton, Pottstown and Allentown, Pa.

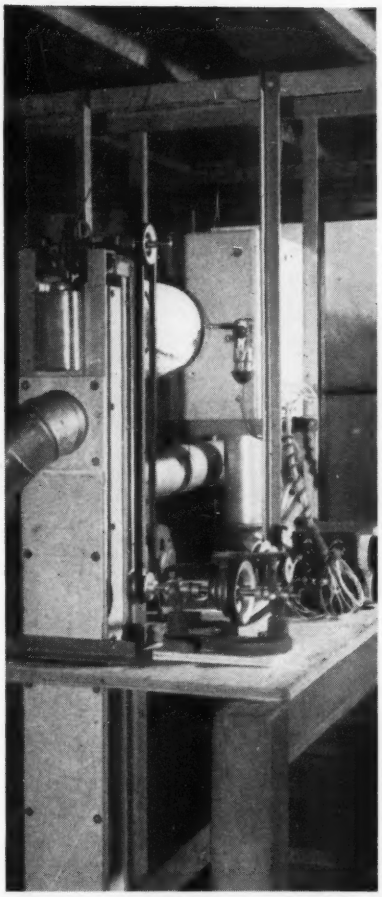
★ ★ ★

**During** the same period, on the West Coast, a comprehensive carbide training program was set up by Carboloy Department with the cooperation of the Navy's Bureau of Ships. Six major Navy yards participated in the training. The classes conducted daily for a week at each yard covered the application and conservation of carbide tools. Carboloy Department service engineers aided the Navy in setting up the training for its personnel from Puget Sound to San Diego and out to Pearl Harbor, actually taking part in most instances.

★ ★ ★

**To date** the Carboloy Department, through its training school facilities in Detroit alone, has conducted more than 600 classes for metalworking people. The school has completed 11 years of operation, with 5400 men and women attending from 1400 companies. Individuals ranging from executives to the men who actually use the tungsten carbide cutting tools came from eleven foreign countries and 40 states.

★ ★ ★



THIS LACQUER TOWER OPERATES LIKE YOURS!

It may not look like the equipment in your plant, yet this pilot lacquer tower duplicates your own lacquering operations.

It is used in the research laboratories of New England Lacquer to test thoroughly all formulated lacquers under actual on-the-job conditions. This and other modern research facilities enable us to formulate lacquers which satisfy your most rigid requirements.

Let our research facilities solve *your* lacquer problems. Write today!

*The above photograph is one of many contained in an eight-page brochure describing our facilities to serve you. Write for your copy of the complete brochure!*

NEW ENGLAND LACQUER CO.
150 KING PHILIP ROAD
EAST PROVIDENCE, R. I.

7 out of 9

WIRE MILLS

*that Liquor Finish Wire*

*use* M&T STANNOUS SULFATE *because*

***Tin Losses Are Reduced . . .***

by elimination of high tin sludging due to incomplete reaction in feather tin method.

***Results Easier to Control . . .***

only two variables to watch — Stannous Sulphate and Copper Sulphate — allows immediate, simple color adjustment.

***Every Batch the Same . . .***

M&T Stannous Sulphate method produces smooth, uniform wire coatings, unvarying from lot to lot.

**See how use of M&T Stannous Sulphate can help you save tin in liquor finishing. Write for engineering data.**

METAL & THERMIT CORPORATION

*Chemical Division*

100 E. 42nd St., New York 17, N. Y.

*Specialists in Tin and Tin Chemicals*


**The** total number of classes held in Detroit, however, does not include the hundreds of field class sessions held through the Department's mobile extension training program.

## Carbide Molds Increase Production

**At Carborundum Co.,** Niagara Falls, N. Y., where Carboloy tungsten carbide-equipped molds are used in producing silicon carbide and aluminum oxide grinding wheels ⅓ to 4-½ inches diameter, the wear-resistant inserts are providing an overall average working life about ten times that of other engineering materials. One 4-inch mold on an automatic press, for instance, produced as many as 86,000 pieces and was still in good condition. The mold employed previously lost its efficiency at the end of 2,500 pieces.

★ ★ ★

**Cost of** the tungsten carbide molds, according to Carborundum, averages about three times that of steel. But the cost is more than offset by the wear-resistant qualities of the tungsten carbide metal. The material used in grinding wheels is very abrasive, and the particles act as millions of tiny grinding wheels, grinding away the metal sides of the molds employed to shape them into wheels under pressure.

★ ★ ★

**Rapid** wearing of the molds impedes long-run production of uniform size grinding wheels, and makes it necessary to replace the molds frequently to keep the wheel dimensions within specifications.

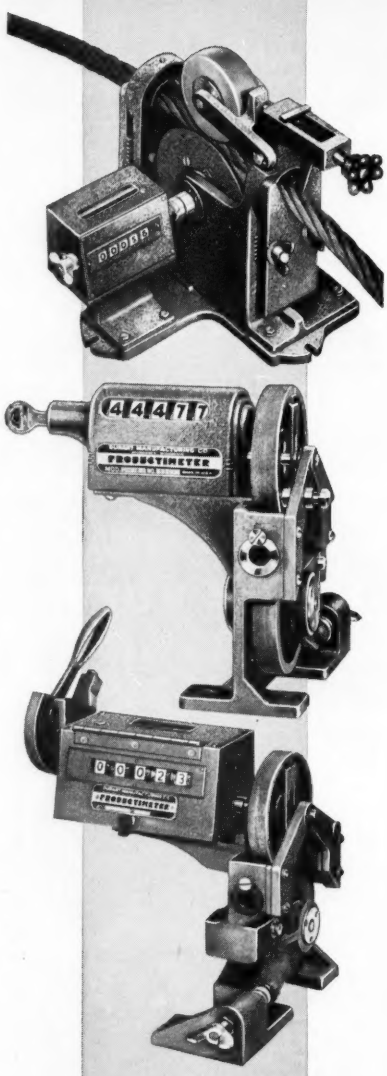
★ ★ ★

**In using** tungsten carbide mold assemblies on automatic presses, mold replacements at Carborundum are reduced drastically. On one automatic press, for example, a total of 180,000 pieces were produced at the rate of 1,000 per hour. Since a third of this quantity could not be made with molds of other materials, the saving on setup time alone amounts to about two thirds. Furthermore, when


PRODUCTIMETER

WIRE MEASURING MACHINES

*Fast . . Accurate . . Dependable . . Legible*



Productimeters measure all types of wire from .010 to 1½ inches in diameter . . . at speeds up to 5,000 feet per minute. They eliminate "guess-work". . . insure profitable operation in your plant.

Send for Catalog No. 40

DURANT MFG. CO.

1918 N. Buffum St. Milwaukee 1, Wis.

118 Orange St. Providence 3, R. I.

Representatives in Principal Cities

PRODUCTIMETERS SINCE 1879 *Count Everything*

the tungsten carbide molds are worn, they are not scrapped but re-sized for re-use, or employed in producing larger grinding wheels.

### Electric Wire Concern Removes to New Plant

**The U. S. Wire & Cable Corp.,** has moved into a new, modern plant at Progress Avenue and Monroe Street, Union, N. J., A. J. Sequeria, president of the firm has announced. The firm was formerly located at 27 Haynes Ave., in Newark, N. J.

★ ★ ★

**The** new plant, with glass brick exterior, will permit the U. S. Wire & Cable firm to triple its production. Mr. Sequeria stated that the firm would continue its heavy schedule of production for the government as well as expand its commercial wire output to better serve the trade.

★ ★ ★

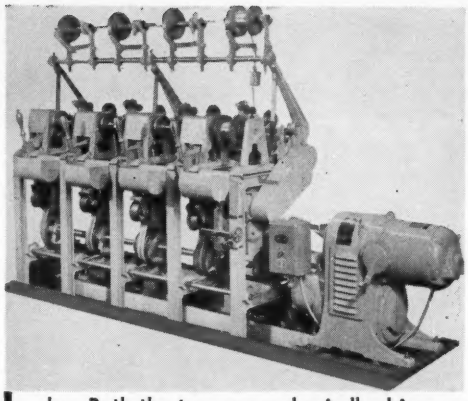
**This** firm makes all types of wire for the radio, television and electronics industries including radio-hookup wire, microphone cable, 300 ohm, twin line and coaxial cables, 4-conductor TV cable, high frequency cables and a variety of building wires. Production is now under way at the new plant.

### C. F. & I. Ninth Largest Steel Producer

**Almost** half of **The Colorado Fuel and Iron Corporation's** manufacturing operations are now carried on east of the Mississippi, it was announced by **A. F. Franz**, President. Colorado Fuel and Iron, the nation's ninth largest steel producer, has 12 plants in 7 states.

★ ★ ★

**C. F. & I.** product diversification in recent years has kept pace with its geographic expansion. The recent acquisition of John A. Roebling's Sons Corporation added important new products to C. F. & I.'s line including cold rolled steel specialities, a broad line of electrical wire and cable, bridge construction products and services, new types of wire rope, strand, cords and assemblies, new types of wire de-

**1900-HV MULTIPLE SPINDLE SPOOLER**

SPECIFICATIONS
Size Range: .010" to .080" or heavier if soft and many flat wire sizes.
Max. Spool Size: 16" flange diameter.
Capacity: usually 4 to 8 spindles.

The 1900-HV Spooler is a rigid, precision machine which will consistently produce a uniform, dense wire lay. Both the traverse and spindle drives are regulated through wide-range, stepless, variable speed units, eliminating change gears. The 1900-HV is completely adaptable to your particular constant or changing demands. All controls are positive. Adjustments are made accurately with the spooler in operation and without tools.

Both smooth acceleration and rapid stopping is obtained through a single lever at each station. Spool changing is simple and rapid. Anti-friction bearings are used on all shafting and spindles.

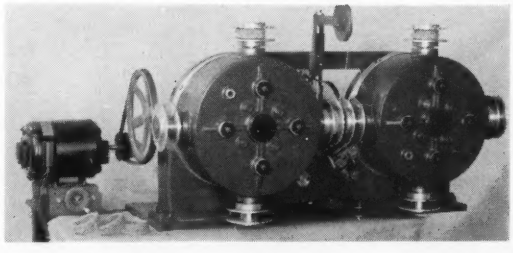
Your special requirements can be incorporated into the design. Each machine is delivered ready for operation from your power supply. Payoff stands furnished as extras.

Consult us on your spooling problems.

**ROBERT J. EMORY COMPANY**
31 East Runyon Street Newark 5, N. J.

**BOYD CONTINUOUS COIL WINDER #3130**

**Semi-Automatic**



Winds short coils (25′ to 200′) continuously. Traverse wire with layer wind. When proper length is wound, guide is forced by solenoid action to opposing spindle turning at same speed. When sufficient turns are wound on second spindle—a knife jumps between heads and cuts wire connecting the two coils. The head with the full coil indexes upward and an empty coil comes into winding position. Operator then easily removes full coil and ties it as desired. Works particularly well with bell and stove pipe wire. Can be speeded for long coils—slowed for shorter. ½H.P. motor provides ample power. Operator requires no training, skill or experience.

**BOYD & SONS MANUFACTURING CORP.** 1434-38 Callowhill St. Philadelphia 30, Pa.

High Quality

**COPPER and BRONZE WIRE**

High Carbon and Low Carbon

Specialty Steel Wire

Spencer wire corporation

555 LEHIGH AVENUE, UNION, N. J.

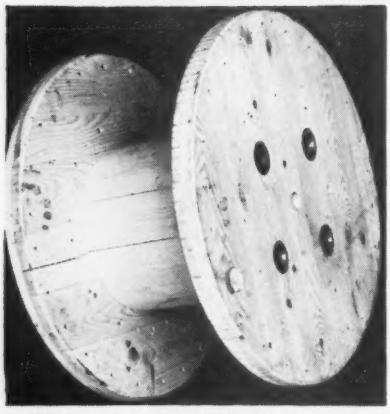
Plants at Union, N.J., Hillside, N.J., West Brookfield, Mass.

**LARGE BOLTED REELS for**

**WIRE ROPE**

*and*

**ELECTRIC CABLE**



*View of typical bolted reel.*

**Made in diameters of from 12" to 48" and furnished knocked-down or assembled. Sturdily constructed of air-dried lumber, using our Linderman process of jointing and well-nailed for strength and rigidity, these strong reels will take severest punishment. Our reels are made to customers' specifications as to size, number of bolts, size of washers, borings and number of plies in each flange. Painting or stenciling can be done as customers may request.**

**Shipped to any point in New England by truck.**

***Write for details and prices on these reels***

**WINCHESTER REEL COMPANY, Inc.**

**ASHUELOT, N. H.** **Tel.: WINCHESTER 163-2**

***Our Products Carry Reel Loads.***

signed for special uses, as well as supplementing, to some extent, our present line of wire products.

★ ★ ★

**With** the addition of the 205,000 ton capacity of the Roebling plants, Colorado Fuel and Iron today has a rated ingot capacity of 2,425,000 net tons per year. This is an increase of 117 per cent in the last 11 years. Their fully integrated plant at Pueblo, Colorado contributes 1,485,000 tons to our rated ingot capacity, while 495,000 tons come from our Claymont, Delaware, plant, and 240,000 tons come from our integrated plant at Buffalo.

★ ★ ★

**Colorado Fuel and Iron** now has a pig iron capacity of 1,550,000 net tons, representing a gain of 146 per cent in the past 11 years.

★ ★ ★

**The** Wickwire Spencer Steel Division was merged with Colorado Fuel and Iron Corporation in 1945. The Colorado Fuel and Iron plant at Claymont, Delaware, formerly owned and operated by the Worth Steel Company, was acquired in March, 1951. The E. & G. Brooke Iron Company at Birdsboro, Pennsylvania, and its subsidiary the Richard Ore Company, near Wharton, New Jersey, were acquired in January, 1952.

★ ★ ★

**Approximately** $46,638,000 was spent by Colorado Fuel and Iron and its subsidiaries for improvements and additions to plant, machinery, and equipment, and for acquisition of property during the five-year period from July 1, 1947 through June 30, 1952.

## X-Ray Analysis Reprint Available from Philips

**A new** 8-page reprint of an article from a national trade magazine titled "Crystal Gazing with X-rays" is available from the Research and Control Instruments Division, **North American Philips Company, Inc.,** 750 South Fulton Avenue, Mount Vernon, N. Y.

★ ★ ★

**The** booklet covers in considerable detail the historical development of X-ray analysis techniques and theory. Considerable space is devoted to the Fourier synthesis, strip methods, Bragg's analogs, X-RAC, Patterson Analysis and criteria for structure analysis.

★ ★ ★

**There** are fourteen illustrations in the booklet including a contour map of electron densities, structure diagram of $B_{10}H_{14}$, a map of two Fourier waves, film strips showing fringes of Fourier terms, and an X-ray photograph of berthierite.

★ ★ ★

**Diagrams** are also included which show the Bragg-Huggins (Photographic Analog) method, MacLachlan's multiple projector, two-wave-length microscope, Buerger's optical system, and the "fly's eye" method.

## Packaging Exposition to Be Held in April

**Close** to 25,000 business executives representing every state and thirty foreign countries are expected at the **American Management Association's** 22nd National Packaging Exposition in Chicago, April 20-23, A.M.A. officials have announced. The four-day show, together with its companion event, A.M.A.'s National Packaging Conference, will be the principal features of Packaging Week.

★ ★ ★

**The** Exposition will require both wings of Chicago's Navy Pier to house an anticipated record 350 exhibitors of machinery, equipment, materials and services. More than 1,500 packaging executives and technicians are expected to attend the conference sessions, April 20-22, which will also be held on Navy Pier.

## New Allied Products Division Set Up by Hamilton Watch

**A new** Allied Products Division to develop, produce and market new products has been set up at **Hamilton Watch Company,** Lancaster, Pa. **Frank A. Christoffel,** former assistant to the president,


Wire testing made simple

**SCOTT TESTERS*** for over 53 years has designed and manufactured accurate, simple, easily operated equipment . . . capable of giving readily understood reproducible values . . . with results in the form of picturized charts.

**TENSILE VALUES** obtained directly from machine records.

**ELONGATION PICTURIZED** on filing size charts.

**LAB OR PRODUCTION TESTING**—accurate determinations on both laboratory and piece-rate scales.

*Are you familiar with our latest developments?*

* Registered Trademark

**SCOTT TESTERS, INC.** 55 Blackstone St. Providence, R. I.

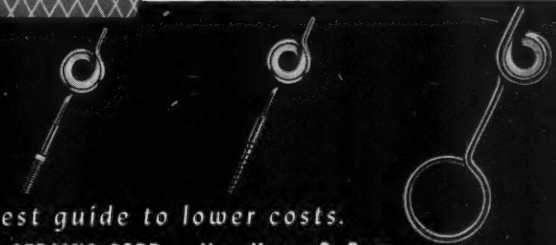
Scott Testers — Standard of the World

HEANIUM®
Presents
a new
revolutionary guide
for the
WIRE
INDUSTRY

* Pigtail covered by patent.

HEANIUM®
is the nearest material to a diamond in hardness — outwears other materials by 2 to 6 years — decreases downtime and permits higher production speeds. Send sample pigtail you're now using. We'll make a Heanium test sample adaptation for your particular application free of charge.

Illustrated:
3 of the many
Heanium Pigtail
applications



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*the best guide to lower costs.*
HEANY INDUSTRIAL CERAMIC CORP. New Haven 3, Conn.

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### CRITICAL CUSTOMERS

For the past ten years we have specialized in the compounding of Vinyl extrusion and injection molding compounds to specifications, or developing compounds for a specific use.

Underwriters' approved standard compounds are available in all colors for POT, T, TW, 80 Degree C, 90 Degree C and 105 Degree C wires.

*Save your plant space for wire processing equipment. Let us tailor your compounds to bring out the special properties you require.*

Your inquiries are invited.

**ELECTRONIC RUBBER COMPANY**

69 Sunnyside Ave. • Stamford, Conn.



## YARNS

For electric wire. Acetate, nylon and silk, natural or dyed. Put up on braider tubes, spools or cops.

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Division of Aetna Industrial Corp.

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INDUSTRIAL DIAMONDS
they ARE available for all industrial applications
75 MEMBER COMPANIES
Cooperating with Industry
INDUSTRIAL DIAMOND ASSOCIATION OF AMERICA, INC.
write for booklet
"THE DIAMOND THAT PAYS FOR ITSELF"
INDUSTRIAL DIAMOND ASSOCIATION OF AMERICA, Inc.
124 E. 40th St., New York 16, N. Y.


has been named to head the new division.

★ ★ ★

**Hamilton's new** Allied Products Division also includes an Ordnance Department, responsible for the completion of 20 million dollars of current defense contracts and negotiation for new contracts. The company's new $350,000 branch plant in East Petersburg, Pa., is now engaged in assembling Army and Navy Ordnance components.

### Bus Duct Booklet Available from Westinghouse

**Bus duct** application to distribution systems of commercial, institutional, and industrial buildings is described in a 12-page booklet available from the **Westinghouse Electric Corporation.**

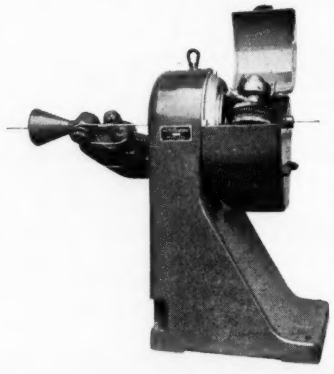
★ ★ ★


## LINÉ-GORCY

**MECHANICAL**

## WIRE ROD DESCALERS

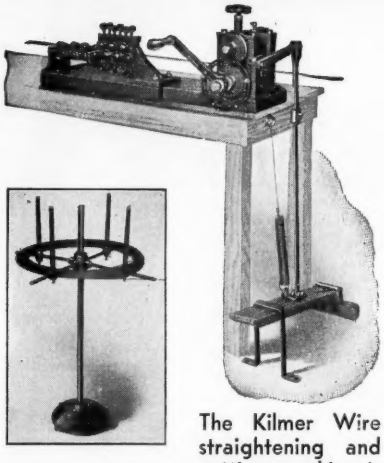
(Patented in U.S.A.)



## FISHER ASSOCIATES

**SOLE AMERICAN DISTRIBUTORS**
**122 East 42nd Street**
**New York 17, N. Y.**
**Telephone: MUrray Hill 5-1937**

**WIRE STRAIGHTENER**



The Kilmer Wire straightening and cutting machine is hand operated and recommended for wire No. 8 to No. 19 gauge.
Wire Reel will handle coils up to 150 lbs. with I.D. adjustments from 7" to 22" and 30" O.D.

**M. D. KILMER & COMPANY**
4840 BROOKPARK RD.
CLEVELAND 9, OHIO

**Top quality non-returnable spools . . . available in standard head and barrel sizes.**

***Write for a quotation today!***

**MASON CAN COMPANY**
1949 Dexter Rd., East Providence 14, R. I.
MASON CAN COMPANY OF OHIO
Greenville, Ohio

**Four** types of bus duct are described: (1) plug-in duct—provides outlets every 12 inches; (2) low-impedance duct—for long feeder runs or where minimum voltage drop is important; (3) weatherproof feeder duct—for outdoor installations; (4) weatherproof low-impedance duct.

★ ★ ★

**Photographs** and application data from actual installations show how bus duct solves distribution problems connected with modernization, expansion, or new building programs. The use of prefabricated elbows, tees and crossovers, and new sliding-type cantilever hangers to make runs of bus duct in any direction, around obstructions and corners, is also described.

★ ★ ★

**For** further information, write Westinghouse Electric Corporation, P.O. Box 2099, Pittsburgh 30, Pennsylvania.

## New, Active, Non-Corrosive Rosin Core Solder Announced

**A new** rosin core solder, active yet non-corrosive, has recently been developed by **Federated Metals Division, American Smelting and Refining Company**, New York, N. Y. Known as RTS 200, it has been proved in production operations to have many advantages over ordinary rosin solders.

★ ★ ★

**Tests** show that the spread of Federated's solder is 30% greater than that of conventional rosin core solders. Oxide films and corrosion products on the parts being soldered need not slow down operations, because this solder pierces such retarding agents four times faster than ordinary solders.

★ ★ ★

**Despite** the exceptional activity of the RTS 200 flux at soldering temperature, there is no harmful corrosion residue when tested under the high humidity conditions of military specification MIL-S-6872. Experience has shown that the flux in the new solder is just as active after standing for long periods as when used immediately.

**Vapor - from - Paper STOPS RUST**

Now wire is being protected in storage and in shipment without oil or grease. VPI vapor permeates area within carton. Makes air and moisture harmless to shiny wire surfaces. For "VPI Facts", write: Angier Corporation, Framingham 3, Mass.

**ANGIER VPI* WRAP**

*Reg. U.S. Pat. Off. Vapor Rust Preventive

***FOR TOUGH, STRONG***

**PLYWOOD**

**REELS & SPOOLS**

**FOR WIRE, ROPE and PLASTICS**

**use those made by the largest plywood reel manufacturer in America.**

***Get our prices today.***

***CHARLES lavendier***
**CO., INC.**

**P. O. Box 402 Pawtucket, R. I.**

***Telephone: PA 2-1300***

# METAL BOUND RETURNABLE REELS

**Made in 12" to 24" diameters.**

**No nails used. *All glued construction.* Made of kiln-dried wood. Special design prevents breaking or splintering of wood, protecting insulated wire from damage.**

**Write for details**

**WILLIAM McCASKIE, INC.**

FORGE ROAD • WESTPORT • MASS.
Tel.: 145 Est. 1903



# *RECLAIM YOUR* DIAMOND POWDER

**with**

## NATIONAL RESEARCH CO.'S

new and exclusive process. This process is more efficient and recovers higher percentages of greater purity of used diamond powders.

Diamonds from worn grinding wheels, grinding wheel sludge and dust, cotton charged with powder used in die polishing, die washings and diamond bearing scrap — all

***RECLAIMED SUCCESSFULLY***

Don't waste diamond bearing materials — they're valuable.

Send it to

## NATIONAL RESEARCH CO.

**25530 Little Mack Avenue**
**St. Claire Shores, Michigan**


**RTS 200** is available in a wide variety of wire sizes, compositions and quantities.

### New Heat Treating Furnace Available from Westinghouse

**Temperatures** up to 3100 F. can be obtained in a new metallurgical heat treating furnace available from the Westinghouse Electric Corporation. A water jacketed chamber, an integral part of the furnace, permits work to be cooled as well as heated in a protective atmosphere. The furnace is designed for use of either hydrogen or dissociated ammonia.

★ ★ ★

**Four** manually operated, counterbalanced doors on the furnace separate its charging, heating and cooling chambers. Intended for batch type heating, the work is handled on trays and manipulated by push and pull rods.

★ ★ ★

**The** cooling chamber is constructed of welded steel plates to incorporate a water jacketed housing. Ample cooling surface is provided to assure cooling of the charge below the oxidation point before it is discharged.

★ ★ ★

**Heating elements** are formed from heavy molybdenum alloy rod into sinuous loops and supported on alundum refractories. The furnace hearth is made of molybdenum alloy to prevent warpage and provide a smooth, hard surface over which the trays are easily moved.

★ ★ ★

**Protective** atmosphere consumption for this high temperature furnace is between 150 and 200 cu. ft. per hour.

★ ★ ★

**For** more information, write **Westinghouse Electric Corporation,** Box 2099, Pittsburgh 30, Pa.

### Pennsalt Introduces Neoprene Paint

**The Pennsylvania Salt Manufacturing Co.,** after three years of testing under the most severe corrosion conditions in its own plants,


HKP PORTER

# HANDKLIP 6C WIRE CUTTER

*For FREE CUTTING of wires, cable, rods, baling wire and bolts up to medium hardness.*

One of the handiest, most useful cutters ever made. Parrot-beak jaw quickly locates material for easy cutting. Protruding tip of jaw prevents wire from slipping, aids in stretching wire and is great for pulling out staples.

Essential equipment for cutting high tensile communication and power wires used in rural electrification (Model 6B with special hard cutting edges). See your supplier.

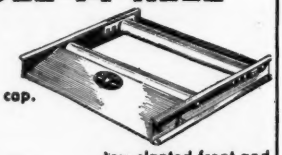
**H. K. PORTER, INC.**
Somerville 43, Mass.
Porter Cutters Porter Pruners
PORTER-FERGUSON Autobody and Fender Repair Tools



*Simple as* A B C

**Handle heavy reels easily and safely; remove wire or cable from top or bottom, front or back of reel with**

# ROLL-A-REEL

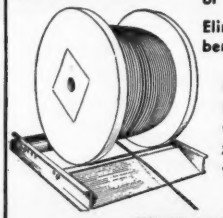


**Style A:**
**2,000 lbs. cap.**
**37.50**

**Style B:**
**4,000 lbs. cap.**
**75.00**

**F.O.B. Cincinnati**

**Low slanted front and positive front lock insure quick loading or unloading.**



**Eliminate jacks, cumbersome handling.**

**Carried easily to reels, job or storage.**

**Sold through wholesalers only.**

**WRITE TODAY FOR DETAILS**

**ROLL-A-REEL**
327 WEST FOURTH STREET
CINCINNATI 2 OHIO

has introduced a new system of anti-corrosion coating using specially formulated neoprene coatings, it was announced today.

★ ★ ★

**The** new formulations, added to Pennsalt's regular line of corrosion resistant paints and cements, are NeoCoat and NeoPrime A (for all surfaces except concrete) and NeoPrime B (for concrete surfaces).

★ ★ ★

**NeoCoat** is a true plastic, involving polymerization, in which the accelerator is included in the product, thus eliminating the necessity of mixing on the job. The polymerization takes place after the coating is applied.

★ ★ ★

**The** special formulation of this coating was developed as the result of Pennsalt's tests and experience in its own plants. In these tests it was found that to stand up in service, a coating had to be built up to a thickness of at least 5 mils, regardless of its corrosion resistance, and had to be especially effective in covering welds, beads, seams and edges where coatings most frequently failed.

★ ★ ★

**It was** also found that it is uneconomical, from the labor and time standpoint, to apply more than three coats, including the primer. Therefore, NeoPrime and NeoCoat were formulated to attain the proper thickness with three coats.

## To Head Purchasing for Cleveland Crane and Engineering

**George W. Urban** has been appointed Purchasing Agent of The Cleveland Crane & Engineering Co., Wickliffe, Ohio, to succeed **Henry Karr,** who has retired after over 50 years of service with the company.

★ ★ ★

**Mr. Urban** was Assistant Purchasing Agent for the past seven years and prior to that was connected with Pesco Products Co. as a buyer in the Purchasing Department.


**PLYWOOD REELS and SPOOLS**

**Engineered to Your Particular Requirements**

**Manufacturers and designers of all types plywood reels and spools for *insulated wire, bare wire, rope and cable.* Used by leading manufacturers. Prompt quotations.**

**CARRIS REELS, INC.**

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**Cut Your Product Cost . . .**

Stop struggling with wire worries. There's a Continental wire to help cut products costs — to add sales appeal. Let us know about your problem . . . Let Continental's helpful wire service work for you.

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*Trade Mark Reg. U. S. Pat. Off.

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**CONTINENTAL STEEL CORPORATION**

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF *Manufacturer's Wire* in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

THE MAN who is "YOUR WIRE SUPPLIER"

**WIRE** STRAIGHTENED AND CUT TO LENGTH

From 16 gauge up to 5/8" diam.
WE WILL FURNISH THE WIRE or STRAIGHTEN and CUT YOUR STOCK.
**"Straight as an Arrow"**

Telephone: ERIE 4-7139

**ERIE IRON & SUPPLY CORPORATION**

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**REELS SPOOLS**

ALL SIZES

WOOD - PLYWOOD - WOOD - METAL

RETURNABLE NON-RETURNABLE

Samples and Prices on Request

**DURKEE MFG. CO.** PINE RIVER, MINN.

**MUSIC WIRE and SPECIAL WIRES**

Music Wire for Industrial Purposes
211 sizes Bright Polished, .0015" to .3125"
45 sizes Bright Tinned, .003" to .125"
Aluminum—Annealed—Belt Lacing—Brass, Soft and Spring—Copper, Bare and Tinned
Coppered Steel Spring—Galvanized—Tinned
Monel—Nickel Silver—Pure Soft Nickel—Oil Tempered, Steel Spring, Black Finish
Phosphor Bronze, Spring Temper—Pure Iron Wire—Resistance Wire,
Hoskins Chromel "A"—Stainless, Soft and Spring Temper—Tag Wire, 1000
in an Envelope—Florist Wire—Spooled and Coiled, 1/4-1/2-1-5#
Wires Straightened and Cut to length—Small Gauges—Small orders our specialty
Wires and Strands for the fishermen. Trolling Wires, Copper-Monel-Stainless.
Leader Wires, "Wilstabrite" Stainless and "Silverbrite" Music.

**THE MALIN & COMPANY**

2514 Vestry Ave. Established in 1884 Cleveland 13, Ohio

***THE BETTER YOUR WIRE . . .***
***THE BETTER YOUR PRODUCT!***

Choose *Cortland* GALVANIZED WIRE

Fine products are made from fine-quality materials. That's why so many fabricators and formers select Cortland Brand specialized low carbon wires. Cortland Brand wires are among the finest available . . . made from the best corrosion-resisting, open-hearth steel in Wickwire's own mills. Use them for your products . . . in any of the following types, sizes and finishes.

Cortland Brand

**SIZE:** coils, spools or straightened cut to length.
**FINISH:** plain, galvanized, coppered or tinned.
**TYPE:** stone wire, bookbinder, flat, etc.

WB

**WICKWIRE BROTHERS, INC.** **CORTLAND, N.Y.**

**WE BUY WE SELL**

We Pay Highest Prices for Used Machinery

10 NEW ENGLAND BUTT
No. 15A TWINNERS — Complete

7 0 WATERBURY-FARRELL
7-Die Rod Wire Drawing Machines

5 12-WIRE 24" Reel TAKEUP STANDS

All Machines Reconditioned in Our Own Shop

**WIRE & TEXTILE MACHINERY INC.**
P. O. BOX 436, PAWTUCKET, R. I.

***Buy the Best:* MONTGOMERY SILVER-COATED COPPER WIRE**

***Round***—Hard or Annealed on Spools. Plain or Stranded for HOOKUP and UHF CABLES.

***Flat***—For Tinsel Ribbons and Tinsel Garlands.

ALSO

Bare Electric Tinsel Conductors for Telephone-Razor-Hearing Aid Cords.

**WRITE FOR DETAILS**

*Send for samples and engineering data.*

THE MONTGOMERY COMPANY
25 Canal St., Windsor Locks, Conn. Tel.: 2-3338

## A Review of Recent Wire Patents

(*Continued from page* 401)

The method of sharpening a metallic wire by etching comprises mounting the wire with a portion thereof external of an etching bath and another portion extending through the surface of and into the bath, floating a layer of liquid which is immiscible with the etchant and is chemically inert to the etchant on the surface of the etching bath to control the shape of the interface between the etching bath and the liquid where the wire penetrates it and partially dissolving that portion of the wire which is immersed in the etching bath and is immediately below the interface.

★ ★ ★

No. 2,629,111, MATTRESS CONSTRUCTION, patented February 24, 1953 by Roman F. Korney, Chicago, Ill., assignor to Simmons Company, New York, N. Y., a corporation of Delaware.

While the construction includes wire spring coils, the invention resides in specially arranged partitions, linings and padding.

★ ★ ★

No. 2,629,430, ZIGZAG SPRING CUSHION CONSTRUCTION HAVING A BASE AND TOP LAYER OF SPRINGS, patented February 24, 1953 by Hyland C. Flint, Birmingham, Mich., assignor to American Metal Products Company, Detroit, Mich., a corporation of Michigan.

The construction includes sinuous wire springs extending across the frame and similar wire springs crossing the first springs and normal thereto.

★ ★ ★

No. 2,629,564, WIRE-LAYING MACHINE, patented February 24, 1953 by George W. Bell, Sterling, Ill., assignor to Northwestern Steel and Wire Company, Sterling, Ill., a corporation of Illinois.

There are twelve claims in this patent to apparatus for continuously laying wire in coils.

★ ★ ★

No. 2,629.575, CLOTHES HANGER ATTACHMENT, patented February 24, 1953 by Clara D. Loyot and Charles G. Loyot, Waterbury, Conn.

An attachment of wire is provided for clipping to a wire clothes hanger to prevent the hanger from sliding along a clothesline or the like.

★ ★ ★

No. 2,629,676, CORROSION INHIBITORS, patented February 24, 1953 by Carl F. Prutton, New York. N. Y., assignor to The Lubrizol Corporation, Wickliffe, Ohio, a corporation of Ohio.

Adapted for metal surfaces, the corrosion inhibitor comprises an oil-soluble organo-metallic phosphide, which compound has a metal substituent solely attached to phosphorus and contains at least one organic radical selected from the class consisting of hydrocarbon and halogen-containing hydrocarbon radicals, and a non-aqueous oil vehicle.

★ ★ ★

## A Note on The Performance of "The Increasing-Load Wire Abrasion Tester"

(*Continued from page* 361)

ment of stroke dn at needle load w

$$dk = w^a dn$$

Since— $w = W_o + bn$ ($W_o$ = 150 grams — For example discussed in note—16 SF)

$b = 12 \frac{\text{grams}}{\text{stroke}}$ — Increase in weight per stroke on proposed tester

$$dw = bdn$$

$$dk = w^a \frac{dw}{b}$$

$$\int_0^K dk = \frac{1}{b} \int_{W_o}^{W} w^a dw$$

$$K = \frac{1}{b} \frac{1}{a+1} (W - W_o)^{a+1} \quad \ldots\ldots (2).$$

where K = total work of abrasion and
W = needle load at which insulation is broken through.

★ ★ ★

**Using** equation (2) to find the values of abrasion determined by means of the proposed tester for two insulations, one requiring twice the amount of abrasive work of the other:

$$K = \frac{1}{b\ (a+1)} (W_1 = W_o)^{a+1}$$

$$2K = \frac{1}{b\ (a+1)} (W_2 = W_o)^{a+1}$$

and the spread ratio of values **if the abrasion resistance value was W—$W_o$**

$$2 = \frac{(W_2 - W_o)^{a+1}}{(W_1 - W_o)}$$

$$\frac{W_2 - W_o}{W_1 - W_o} = \frac{1}{2^{a+1}}$$

and assuming a = 3.5

$$\frac{W_2 - W_o}{W_1 - W_o} = 1.16.$$

★ ★ ★

**Since** abrasion resistance values are measured by the final weights $W_1$ and $W_2$, and not by $W_2$—$W_o$ and $W_1$—$W_o$, the spread ratio is reduced even further than from 2 to 1.16. It must be clear that the above is not intended to be a true analysis of the abrasion testers, but simply an explanation of how the proposed tester compresses the range of abrasion resistance values.

## Furnace Manufacturer Appoints District Representatives

**New** district managers announced recently by the **Lee Wilson Engineering Co., Inc.,** Cleveland, Ohio, are **J. H. Werner,** southern and midwestern territory, operating out of Chicago; **J. L. Kozma,** centrally located in his territory at Pittsburgh; and **R. L. Corbett** who continues coverage of Ohio from the Cleveland office. **Vernon L. Miller,** formerly chief engineer, has been made district manager for the eastern territory with headquarters in the New Haven, Conn., area.

Warner

BELL-MINE LIME

*for*

WIRE DRAWING

**WARNER COMPANY**
BELLEFONTE DIVISION
BELLEFONTE, PA.

Sales Office
Philadelphia—Pittsburgh—New York

## Eutectic Welding Alloys Appoints Executives

**Walter R. Hillman** was recently appointed assistant to the vice president in charge of production at **Eutectic Welding Alloys Corp.,** Flushing, N. Y. At the same time it was announced that **Joseph Quaas** was appointed manager, electrode production division and **Andre Jaccard,** assistant to the executive vice president.

**TUNGSTEN CARBIDE WIRE DRAWING DIES**

**DESIGNED FOR LONG LIFE AND MAXIMUM WIRE PRODUCTION**

Furnished semi-finished to within .001" to .002" of finished size at rough-drilled die prices. Require only light sizing and polishing before using. Our dies embody special design features that make for superior performance.

Also, a full line of carbide tooling for the Cold Heading Industry

**EASTERN CARBIDE CORPORATION**
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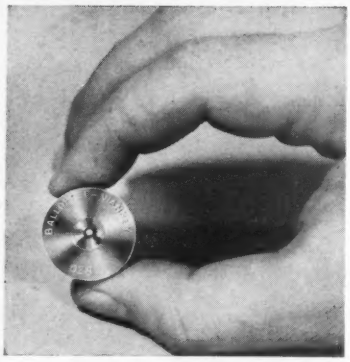

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## O. D. Lloyd Named Sales Manager of General Box Louisville Corrugated Division

**W. C. Embry,** Vice President and Director of the General Box Company, announces the appointment of **O. D. Lloyd** as Sales Manager of its Louisville Corrugated Division. Mr. Lloyd brings many years of valuable experience in both sales and production in the Corrugated Shipping Container field. He was formerly manager of the Cleated Corrugated Department of the Cornell Paperboard Products Company of Milwaukee, Wisconsin. He was a member of the Army Ordnance Packaging Staff during World War II. He is married and has three children.

## Anaconda's Research Director ASQC Panel Member

**H. E. Thompson,** Director of Research for the **Anaconda Wire & Cable Co.,** Hastings-on-Hudson, N. Y. will be a panel member at the Seventh Annual Convention of the American Society for Quality Control, to be held May 27-29 in Philadelphia, Pa.

★ ★ ★

**Mr. Thompson** will sit as a member of the Wednesday, May 27th afternoon session discussing: "What is the Quality Control Job?" Other members of the panel include **William H. Smith,** Ford Motor Co.; **A. V. Feigenbaum,** General Electric Co.; **Anthony Oladko,** Johnson & Johnson; and **J. M. Juran,** Consulting Management Engineer. Dr. Juran will moderate the session.

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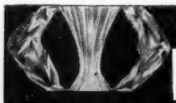

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## Safety in Wire Drawing Operations

(*Continued from page* 378)

the cleaning house and the draw benches. Stockers have been hit on the head by falling parts from tramrail braces.

★ ★ ★

**All these** things have led us to encourage wire drawers and stockers to wear hard hats. The response has been gratifying.

★ ★ ★

**As to** clothing, we recommend long sleeved shirts over long sleeved underwear, because of hot wires.

★ ★ ★

**Our people** usually wear two pairs of gauntlet monkey-face or hot mill gloves over gaunlet engineers gloves. On bull blocks, men usually wear cotton gauntlets with leather palm.

★ ★ ★

**The success** of a wire drawing safety program, as in any other safety program, depends entirely on the attitude of the superintendent and the quality of foremanship.

★ ★ ★

**Any success** that we have attained, has largely resulted from the enthusiastic response of our supervision to the accident prevention program. Their willingness to dig into accident causes and their desire to eliminate accidents has been the most important factor in reducing our accident frequency from a high mark of 63 in 1943 to 3 for the first eight months of 1952.

★ ★ ★

**We know** we don't have all the answers, but we do feel that we have learned a lot and are on our way.

## Swedish Steel Works Uses American X-Ray Units

**Photo** shows research technician at the famous **Sandvik Steel Works**, Sandviken, Sweden, making qualitative and quantitative analyses with the aid of a complete X-ray diffraction and Geiger-counter X-ray Spectrometer installation supplied by **North American Philips Company, Inc.,** Mount Vernon, N. Y.

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★ ★ ★

**The** X-ray instruments are also used for development and research on preferred orientation in cold-rolled strips, particularly on Silicon-iron alloys for magnetic purposes. In addition, Sandvik employs X-ray analysis to determine relative amounts of martensite and retained austenite in hardened steel.

## Moisture Resistance of Insulated Conductors—A General Review

(*Continued from page* 373)

15 years ago, insulating materials are available today that have such superior moisture resisting properties that this condition is no longer considered a serious hazard to cable operation.

★ ★ ★

**Not only** has the development of new insulating materials and compounds contributed to this situation but the development of suitable laboratory yardsticks or test methods to correctly evaluate moisture-resistance has also afforded a necessary contribution.

★ ★ ★

**Because** of the various possible effects of moisture on insulation, the end-use should be analyzed carefully before arriving at a choice of materials and design. In any event, it should no longer be mandatory to specify a lead sheathed cable design for wet locations. There is no question but that we are headed for still better moisture-resistant insulations and better tools towards a more intelligent understanding of the problem.

## Green Resigns from Fidelity

**Howard I. Green,** vice president and managing director of **Fidelity Machine Company, Inc.,** Philadelphia, Pa., has announced his resignation, effective immediately. His action coincides with the sale of the Green interests, which represents one of the largest blocks of Fidelity stock.

Mr. Green was a member of the syndicate which took over Fidelity in 1946. He was particularly responsible for bringing the company up to its present position of leadership in the development and manufacture of specialized equipment for the textile, wire and rubber industries.

Asked about his future plans, Green indicated that he would probably remain in the industry in which he has become well known.

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## C. Ray Harmon Taking New Post on Pacific Coast

**C. Raymond Harmon,** formerly Sales Manager of the Carbide Division of Firth Sterling, Inc., left the company on March 1st to assume new duties as President of the **Leach Relay Company** in Los Angeles and its two wholly-owned subsidiaries, the Palmer Electric Company and the Jeffries Transformer Company.

★ ★ ★

**Mr. Harmon** will continue his membership in THE WIRE ASSOCIATION and has expressed the hope that should any of his many friends in the wire industry get out to California, they will make it a point to pay him a visit. He plans to be back for the Annual Conventions as usual. We all wish him full measure of success in his work as the chief executive of the Leach Relay Company.


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# Index to Advertisers


A

Acrometal Products, Inc. ..... 366
Aetna-Standard Eng'g Co., The ..... 404
Aetna-Standard Eng'g Co., Plastics Div. ..... 347
Ajax Industrial Supplies, Inc. ..... 420
American Chemical Paint Company ..... 385 and 387
American Insulating Machinery Company ..... 396
American Optical ..... 380
American Steel & Wire Division U. S. Steel Corp. ..... 336
American Woodworking Co. ..... 422
Angier Corporation, The ..... 415
Apco Mossberg Co. ..... 406
Apex Alkali Products Co. ..... 344

B

Baird Machine Co., The ..... 345
Balloffet-Vianney Wire Die Co., Inc. ..... 420
Belding Heminway ..... 391
Bethlehem Steel Company ..... 326
Bick, Hans C., Inc. ..... 423
Boulin, Victor J., Inc. ..... 420
Boyd & Sons Mfg. Corp. ..... 411
Bridge Mfg. Co. ..... 331

C

Canada Reel Co. ..... 354 and 421
Carboloy Dept. of General Electric Co. ..... 376 and 377
Carl-Mayer Corp., The ..... 404 and 405
Carris Reels, Inc. ..... 417
Ceilcote Co., The ..... 422
Chase Brass & Copper ..... 349
Chemsteel Construction Co., Inc. ..... 422
Cleveland Tramrail Division of The Cleveland Crane & Engineering Co. ..... 351
Cochaud Wire Die Corp. ..... 420
Continental Steel Corporation ..... 417
Cook Mfg. Co. ..... 332

D

Danforth Co., C. W., The ..... 421
Durant Mfg. Co. ..... 410
Durkee Mfg. Co. ..... 417
Dykrex Corporation of America—Roos Tool & Mfg. Div. ..... 406

E

Eastern Carbide Corp. ..... 419
Eisler Engineering Co., Inc. ..... 422
Electric Furnace Company, The ..... Back Cover
Electronic Rubber Co. ..... 414
Elgin National Watch Co., Abrasives Div. ..... 335
Emory, Robert J. Company ..... 411
Entwistle, James L., Co. ..... 358 and 395
Erie Iron & Supply Corp. ..... 417

F

Fatigue of Materials Laboratory ..... 423
Fidelity Machine Co., Inc. ..... 381
Firth Sterling, Inc. ..... 325
Fisher Associates ..... 414
Fort Wayne Wire Die, Inc. ..... 420

G

Gerber, J. & Co., Inc. ..... 407
Glader, Wm. Machine Works ..... 389
Glass Fibers, Inc. ..... 346

H

Haskell-Dawes Machine Co., Inc. ..... 407
Haveg Corporation ..... 422
Heany Industrial Ceramic Corp. ..... 413
Heineman Corp., Oscar ..... 414
Holden, A. F. Co. ..... 330
Howsam Spool Company ..... 421
Hughesville Machine & Tool Company ..... 392

I

Imhoff, Wallace G., Co. ..... 423
Indiana Wire Die Company ..... 420
Industrial Diamond Association ..... 414
Industrial Diamond Powders, Inc. ..... 421
Industrial Ovens, Inc. ..... 421

J

Johnson Steel & Wire Co., Inc. ..... 383

K

Kelly Wire Die Corporation ..... 420
Keystone Steel & Wire Company ..... 386
Kilmer, M. D. & Co. ..... 415

L

Lancaster, Allwine & Rommel ..... 423
Lavendier, Charles Co., Inc. ..... 415
Lewis Machine Company, The ..... 397

M

Malin & Company, The ..... 418
Manco Mfg. Co. ..... 390
Marshall-Richards Machine Co., Inc. ..... 327
Mason Can Company ..... 415
McCaskie, Wm., Inc. ..... 418
Metal Carbides Corporation ..... 352
Metal and Thermit Corporation ..... 410
Mettler Machine Tool, Inc. ..... 338
Meyer, Roth & Pastor ..... 394
Micro Products Company ..... 379
Miller, R. H. Co., Inc. ..... 333
Milton Machine Works, Inc. ..... 409
Montgomery Co., The ..... 418
Morgan Construction Company ..... 328
Morrison Industries, Inc. ..... 422
Mossberg Pressed Steel Corp. ..... 396

N

National Machinery Exchange ..... 422
National Research Co. ..... 416
National Rubber Machinery Co. ..... 393
Nelson Company, The ..... 422
New England Butt Company ..... 422
New England Lacquer Co. ..... 409
New England Wire Die Co. ..... 420
Niehaus, K. A. Maschinenfabrik ..... 392
Niles Steel Products Div., Republic Steel Corp. ..... 329
Nilson, A. H. Machine Co., The ..... 408
Nopco Chemical Co. ..... 356
North Anson Reel Co. ..... 421
Norton Co. ..... 405
Nukem Products Corp. ..... 421

P

Pacific Coast Borax Company ..... 408
Parkin Chemical Co., The ..... 422
Pittsburgh Steel Company ..... 342
Platt Brothers & Co., The ..... 421
Porter, H. K., Inc. ..... 416
Pourtier Freres, Ets. ..... 402

R

Rayaloy Carbide Corp. ..... 421
Republic Steel Corp., Pressed Steel Div. ..... 329
Roebling, John A. Sons Co. ..... 356A and 388A
Roll-A-Reel ..... 416
Roux Wire Die Works, Inc. ..... 334
Royle, John & Sons ..... 402
Rusch Wire Die Corporation ..... 420

S

Scott Testers, Inc. ..... 413
Scudder, E. J. Foundry & Machine Co., Inc. ..... 421
Sjogren Tool and Machine Co., Inc. ..... 400
Sleeper & Hartley, Inc. ..... 422
Solar Compounds Corporation ..... 382
Specialty Wire ..... 421
Spencer Wire Corp. ..... 412
Standard Industrial Compounds Co., Inc. ..... 337
Standard Mill Supply Co. ..... 403
Steel Equipment Co. ..... 398
Surface Combustion Corp. ..... 421
Swift & Company ..... 343
Syncro Machine Company ..... 353

T

Techema Co., The ..... 421
Terkelsen Machine Co. ..... 421
Torrington Mfg. Co. ..... 388
Trauwood Engineering Co., The ..... 421

U

U. S. Steel Corp.—American Steel & Wire Div. ..... 336

V

Vascoloy-Ramet Corporation ..... 356B
Vaughn Machinery Company ..... Front Cover

W

Wafios Maschinenfabrik ..... 394
Wardwell Braiding Machine Co. ..... 384
Warner Company ..... 419
Wartenweiler, Emilio ..... 401
Waterbury Farrel Foundry & Machine Co. ..... 422
Watson Machine Company ..... Inside Back Cover
Wayne Wire Die Co. ..... 420
Wean Equipment Corporation ..... 362
Wells, Frank L. Co. ..... 399
Westinghouse Electric Corp. Industrial ..... 340-341
Wickwire Brothers, Inc. ..... 418
Wilson, Lee Engineering Co., Inc. ..... Inside Front Cover
Winchester Reel Co., Inc. ..... 398
Wire Insulating Mach'y, Inc. ..... 419
Wire & Textile Machinery, Inc. ..... 418

Y

Youngstown Sheet & Tube Company, The ..... 339
Youngstown Welding & Eng'g Co. ..... 400

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American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Metal & Thermit Corp., New York, N. Y.

**COMPOUNDS—Phosphate Coating**
American Chemical Paint Co., Ambler, Pa.

**COMPOUNDS—Rust Preventing**
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.

**COMPOUNDS—Rust Removing**
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Standard Industrial Compounds Co., Chicago.

**COMPOUNDS—Vinyl, for Wire**
Electronic Rubber Co., Stamford, Conn.

**COMPOUNDS—Wire Drawing**
Apex Alkali Products Co., Philadelphia, Pa.
Bick, Hans C., Inc., Reading, Pa.
Miller, R. H. Co., Inc., Homer, N. Y.
Nopco Chemical Co., Harrison, N. J.
Pacific Coast Borax Co., New York, N. Y.
Standard Industrial Compounds Co., Chicago.
Swift & Company, Chicago, Ill.

**CONDUCTORS—Flexible, Electrical**
Montgomery Co., The, Windsor Locks, Conn.

**COPHOLDERS—Steel**
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Wire & Textile Mach'y, Inc. (used) Pawtucket. R. I.

**CORDS—Electrical, Tinsel Conductor**
Montgomery Co., The, Windsor Locks, Conn.

**CORROSION PREVENTIVE PAPERS—**
Angier Corporation, The, Framingham, Mass.

**CRANES—Wire Mill**
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

**CUTTING TOOLS—Carbide**
Carboloy Dept. of General Electric Co., Detroit.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Metal Carbides Corporation, Youngstown, Ohio
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.

**CUTTING TOOLS—Wire**
Manco Manufacturing Co., Bradley, Ill.
Porter, H. K. Inc., Somerville, Mass.

**DIAMONDS—Industrial**
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

**DIAMOND POWDERS—**
American Coldset Corp., Paterson, N. J.
Danforth, The C. W. Co., Youngstown, Ohio
Elgin National Watch Co., Abrasive Div., Elgin, Ill.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Indiana Wire Die Co., Ft. Wayne, Ind.
Industrial Diamond Powders, New Kensington, Pa.
National Research Company, St. Claire Shores, Mich.
New England Wire Die Co., Worcester, Mass.
Roux Wire Die Works, Inc., Oriskany, N. Y.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

**DIAMOND POWDER RECLAIMING—**
Boulin, Victor J., Inc., New York, N. Y.
Danforth, The C. W. Co., Youngstown, Ohio
Industrial Diamond Powders, Inc., New Kensington, Pa.
National Research Co., St. Claire Shores, Mich.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.

**DIAMOND TOOLS—**
Carboloy Dept. of General Electric Co., Detroit.
Indiana Wire Die Co., Ft. Wayne, Ind.
Metal Carbides Corporation, Youngstown, Ohio
Roux Wire Die Works, Inc., Oriskany, N. Y.
Wayne Wire Die Co., Hillside, N. J.

**DIES—Carbide, Tungsten & Tantalum**
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Carboloy Dept. of General Electric Co., Detroit.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Wayne Wire Die Co., Hillside, N. J.

**DIES—Cold Heading**
Carboloy Dept. of General Electric Co., Detroit.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Ft. Wayne, Ind.
Metal Carbides Corporation, Youngstown, Ohio
Vascoloy-Ramet Corp., No. Chicago, Ill.

**DIES—Diamond**
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Cochaud Wire Die Corp., New York, N. Y.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
North American Philips Co., Inc., New York.
Roux Wire Die Works, Inc., Oriskany, N. Y.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

**DIES—Extrusion**
Carboloy Dept. of General Electric Co., Detroit.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Metal Carbides Corporation, Youngstown, Ohio
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

**DIES—Eyelet**
Eastern Carbide Corp., Now Rochelle, N. Y.
Kelly Wire Die Corp., New York, N. Y.

**DIES—Pointing**
Sjogren Tool and Machine Co., Auburn, Mass.

**DIES—Repairs & Re-Cutting**
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc, New York, N. Y.
Carboloy Dept. of General Electric Co., Detroit.
Cochaud Wire Die Corp., New York, N. Y.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Ft. Wayne Wire Die., Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio
New England Wire Die Co., Worcester, Mass.
North American Philips Co., Inc., New York.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Wayne Wire Die Co., Hillside, N. J.

**DIES—Special Shapes, Etc.**
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Ft. Wayne, Ind.

**DIES—Swaging**
Sjogren Tool and Mach. Co., Inc., Auburn, Mass.

**DIES—Tube Drawing**
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Carboloy Dept. of General Electric Co., Detroit.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.

**DRAW BENCHES—**
(See MACHINERY—Draw Benches)

**DRUMS & TRAVERSES—Flange Steel**
Entwistle, Jas. L. Co., Providence, R. I.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio

**DRYING EQUIPMENT**
Carl-Mayer Corp., The, Cleveland, Ohio
Industrial Ovens, Inc., Cleveland, Ohio.
Rockwell, W. S. Co., Fairfield, Conn.

**ENGINEERS—Consulting**
Metal Fatigue—Fatigue of Materials Laboratory, Princeton, N. J.
Wire Insulating and Rubber and Plastics Processing—Hale and Kullgren, Inc., Akron, Ohio
Zinc—Imhoff, Wallace G., Co., No. Highlands, Calif.

**EYELETS—Brass or Zinc**
Platt Bros. & Co., The, Waterbury, Conn.

**FENCING & FENCES—Wire**
Interlocking Fence Co., Morton, Ill.

**FOAM PRODUCING COMPOUNDS—**
American Chemical Paint Co., Ambler, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

**FURNACES—Brazing**
Electric Furnace Co., Salem, Ohio
Harper Electric Furnace Corp., Buffalo, N. Y.
Rockwell, W. S. Co., Fairfield, Conn.
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

**FURNACES—Galvanizing Equipment**
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio
Holden, A. F. Co., The, Detroit, Mich.
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Trauwood Engineering Co., The, Cleveland, Ohio
Wilson, Lee, Engr. Co., Cleveland, Ohio

# WHERE TO BUY, Continued

**For more complete information, consult the annual Wire and Wire Products Buyers' Guide.**

**FURNACES—Heat Treating**
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Holden, A. F., Co., The, Detroit, Mich.
Morrison Industries, Bedford, Ohio
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Trauwood Engr. Co., Cleveland, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.
Wilson, Lee, Engr. Co., Cleveland, Ohio

**FURNACES—Lead Melting**
Electric Furnace Co., Salem, Ohio
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

**FURNACES—Pot (oil, gas, electric)**
Ajax Electric Co., Inc., Philadelphia, Pa.
Holden, A. F., Co., The, Detroit, Mich.
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

**FURNACES—Resistance Heating, Strand**
(See Annealing Machines)

**FURNACES—Salt Bath**
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio
Holden, A. F., Co., The, Detroit, Mich.
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

**GALVANIZING EQUIPMENT — (See MACHINERY—Galvanizing Wire)**

**GRINDERS—Roll**
Norton Co., The, Worcester, Mass.

**GUIDES—for Wire**
Heany Industrial Ceramic Corp., New Haven Conn.

**HAMMERS—Swaging**
Sjogren Tool and Machine Co., Auburn, Mass.

**HOOKS—Pickling & Liming**
Youngstown Welding & Eng'g' Co., Youngstown, Ohio

**HOISTS—Electric Travelling**
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio

**IMPREGNATING MATERIALS—**
Solar Compounds Corporation, Linden, N. J.

**INHIBITORS—Pickling**
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

**INSULATING MATERIALS—**
Belding Hemingway, New York, N. Y.
Electronic Rubber Co., Stamford, Conn.
Glass Fibers, Inc., Toledo
Heineman Corp., Oscar, Chicago, Ill.
Merrimac Paper Co., New York, N. Y.
New England Lacquer Co., E. Providence, R. I.
Solar Compounds Corporation, Linden, N. J.
Solar Varnish Corp., Linden, N. J.

**INSULATING MATERIALS — Paper—For Electric Wire Cable**
Merrimac Paper Co., New York, N. Y.
Solar Compounds Corporation, Linden, N. J.
Solar Varnish Corp., Linden, N. J.

**LACQUERING SYSTEMS — See MACH.—Lacquering Electric Wire**

**LACQUERS—For Electric Wire**
New England Lacquer Co., E. Providence, R. I.
Solar Compounds Corporation, Linden, N. J.

**LAME—LAHN—**
Montgomery Co., The, Windsor Locks, Conn.

**LIME—**
Warner Co., Philadelphia and Bellefonte, Pa.

**LUBRICANTS — For Metal Cutting, Stamping and Drawing**
Apex Alkali Products Co., Philadelphia, Pa.
Miller, R. H., Co., Inc., Homer, N. Y.
Nopco Chemical Co., Harrison, N. J.
Standard Industrial Compounds Co., Chicago.

**LUBRICANTS—Wire Drawing**
(See Compounds—Wire Drawing)

**LUBRICANTS—Wire Rope**
Swift & Co., Chicago, Ill.

**LUMBER—Wire Mill, Carload shipments for lagging and car blocking**
Canada Reels, Ltd., Bury, Que., Canada
North Anson Reel Co., No. Anson, Me.

**MACHINERY—Armoring (Cable, Wire, Hose)**
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc., (used), Pawtucket, R. I.

**MACHINERY—Barbed Wire**
Glader Machine Works, Chicago, Ill.
Wean Engineering Co., Cleveland, Ohio

**MACHINERY—Bolts & Rivets**
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany

**MACHINERY—Braiding**
Fidelity Machine Co., Inc., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Wardwell Braiding Mach. Co., Central Falls, R.I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

**MACHINERY—Bunching**
Cook Manufacturing Co., The, Paterson, N. J.
Federal Manufacturing Co., Wallingford, Conn.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

**MACHINERY—Bundling, Scrap**
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

**MACHINERY—Cable, Electric**
American Insulating Mach'y Co., Phila., Pa.
Fidelity Machine Co., Inc., Philadelphia, Pa.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Capstans (See Machinery—Winding Wire)**

**MACHINERY—Chain Making**
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany
Nilson, A. H. Machine Co., Bridgeport, Conn.

**MACHINERY—Closing Rope**
Watson Machine Co., Paterson, N. J.

**MACHINERY—Coiling Rod**
Vaughn Mach'y Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

**MACHINERY—Cold Heading**
Waterbury-Farrel Fdry. Mach. Co., Waterbury, Conn.

**MACHINERY—Copper Wire Drawing**
Aetna-Standard Engineering Co., Pittsburgh.
American Insulating Mach'y Co., Phila., Pa.
Hale and Kullgren, Inc., Akron, Ohio
National Mach'y Exch. (Used), New York.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

**MACHINERY—Covering Wire (See MACHINERY—Insulating Wire)**

**MACHINERY—Cutting**
Eisler Engineering Co., Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio
Manco Manufacturing Co., Bradley, Ill.
Mettler Machine Tool, Inc., New Haven, Conn.
Porter, H. K., Inc., Somerville, Mass.
Wean Equipment Corp., Cleveland, Ohio

**MACHINERY—Descaling Rod, Dry**
Fisher Associates, New York, N. Y.

**MACHINERY—Die Making**
American Optical Co., Instrument Div., Buffalo, N. Y.
Victor J. Boulin, Inc., New York, N. Y.
Carboloy Dept. General Electric Co., Detroit, Mich.
Firth Sterling, Inc., Pittsburgh, Pa.
Kelly Wire Die Corp., New York, N. Y.
Dykrex Corp., Roos Tool & Mfg. Div., Newark, N. J.
Wayne Wire Die Co., Hillside, N. J.

**MACHINERY—Draw Benches**
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wartenweiler, Emilo, Milano, Italy

**MACHINERY—Edging (See MACHINERY — Tandem Rolling and Edging Mills)**

**MACHINERY—Enameling**
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Industrial Ovens, Inc., Cleveland, Ohio

**MACHINERY—Extruding**
Aetna-Standard Engineering Co., Pittsburgh.
Hale and Kullgren, Inc., Akron, Ohio
National Rubber Machinery Co., Akron, Ohio
Royle, John, & Sons, Paterson, N. J.
Standard Machinery Co., Mystic, Conn.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

**MACHINERY—Fence**
Glader, Wm., Machine Works, Chicago, Ill.
Interlocking Fence Co., Morton, Ill.
Malmedie Maschinenfabrik, Dusseldorf, Germany
Wean Equipment Corp., Cleveland, Ohio

**MACHINERY—Filament Coil Winding**
Eisler Engineering Co., Newark, N. J.

**MACHINERY—Flat Wire**
Mettler Machine Tool, Inc., New Haven, Conn.
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp. Cleveland, Ohio

**MACHINERY—Forming Wire**
Baird Machine Co., Stratford, Conn.
Nilson, A. H., Machine Co., Bridgeport, Conn.

**MACHINERY—Galvanizing Wire**
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, O.
Wilson, Lee, Engr. Co., Cleveland, Ohio

**MACHINERY—Gang Winders**
Entwistle, Jas. L. Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Grinding**
Norton Co., The, Worcester, Mass.

**MACHINERY—Insulating Wire**
Aetna-Standard Engineering Co., Pittsburgh, Pa.
American Insulating Mach'y Co., Phila., Pa.
Ets. Pourtier Frères, Romainville, France
Fidelity Machine Co., Inc., Philadelphia, Pa.
Hale and Kullgren, Inc., Akron, Ohio
National Rubber Machinery Co., Akron, Ohio
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Mach. Co., Central Falls, R.I.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Knitting**
Fidelity Machine Co., Inc., Philadelphia, Pa.

**MACHINERY—Lacquering Electric Wire**
American Insulating Mach'y Co., Philadelphia.
Industrial Ovens, Inc., Cleveland, O.

**MACHINERY—Lock Washer**
Sleeper & Hartley, Inc., Worcester, Mass.

**MACHINERY—Looms, Wire Weaving**
Interlocking Fence Co., Morton, Ill.

**MACHINERY—Material Handling**
(See Material Handling Equipment)

**MACHINERY—Measuring Wire & Cable**
Davis Electric Co., Wallingford, Conn.
Durant Mfg. Co., Milwaukee, Wis.
Entwistle, Jas. L. Co., Providence, R. I.
New England Butt Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Nail and Tack**
Baird Machine Co., The, Stratford, Conn.
Glader, Wm., Machine Works, Chicago, Ill.
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

**MACHINERY—Optical, for Dies**
American Optical Co., Instrument Div., Buffalo, N. Y.

**MACHINERY—Pickling**
Chemsteel Construction Co., Pittsburgh, Pa.
Youngstown Welding & Eng'g. Co., Youngstown, Ohio

**MACHINERY—Pin Making**
Baird Machine Co., The, Stratford, Conn.

**MACHINERY—Pointing**
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Hale and Kullgren, Inc., Akron, Ohio
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany
Morgan Construction Co., Worcester, Mass.

# WHERE TO BUY, Continued

**For more complete information, consult the annual Wire and Wire Products Buyers' Guide.**

National Mach'y Exch. (Used), New York, N. Y.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio

**MACHINERY—Poulty Wire Fencing**
Interlocking Fence Co., Morton, Ill.
Malmedie Maschinenfabrik, Dusseldorf, Germany
Wean Equipment Corp., Cleveland, O.

**MACHINERY—Pre-Heater for Wire (for Extrusion of Plastics)**
Industrial Ovens, Inc., Cleveland, Ohio
National Rubber Machinery Co., Akron, Ohio

**MACHINERY—Re-Spoolers**
Boyd & Sons Manufacturing Corp., Philadelphia, Pa.
Davis Electric Co., Wallingford, Conn.
Eisler Engineering Co., Newark, N. J.
Emory, Robert J., Co., Newark, N. J.
Entwistle, Jas. L. Co., Providence, R. I.
National Mach'y Exch. (Used), New York, N. Y.
Steel Equipment Co., Cleveland, Ohio
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.
Wire Insulating Machy., Inc., Manchester, Conn.

**MACHINERY—Rod Mill**
Morgan Construction Co., Worcester, Mass.
Wean Equipment Corp., Cleveland, Ohio

**MACHINERY—Rolling Mill**
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Engineering Co., Cleveland, Ohio

**MACHINERY—Rubber Insulating**
National Rubber Machinery Co., Akron, Ohio
Royle, John & Sons, Paterson, N. J.
Standard Machinery Co., Mystic, Conn.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

**MACHINERY—Spark Testing**
Davis Electric Co., Wallingford, Conn.
Entwistle, Jas. L. Co., Providence, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

**MACHINERY—Spring Making**
Carlson Company, The, New York, N. Y.
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wells, Frank L., Co., Kenosha, Wisc.

**MACHINERY—Staple**
Sleeper & Hartley, Inc., Worcester, Mass.

**MACHINERY—Straightening & Cutting**
Kilmer, M. D., & Co., Cleveland, Ohio
Lewis Machine Co., The, Cleveland, Ohio
Medart Co., The, St. Louis, Mo.
Mettler Machine Tool Co., New Haven, Conn.
Meyer, Roth & Pastor Maschinenfabrik, Koln-Raderberg, Germany
National Mach'y Exch. (Used), New York, N. Y.
Wartenweiler, Emilio, Milano, Italy
Wells, Frank L., Co., Kenosha, Wisc.

**MACHINERY—Stranding**
Haskell-Dawes Machine Co., Philadelphia, Pa.
Hughesville Machine & Tool Co., Hughesville, Pa.
Milton Machine Works, Inc., Milton, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Swaging**
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

**MACHINERY—Take-Up and Pay-Out**
Aetna-Standard Engineering Co., Pittsburgh, Pa.
American Insulating Mach'y Co., Phila., Pa.
Davis Electric Co., Wallingford, Conn.
Federal Manufacturing Co., Wallingford, Conn.
Hale & Kullgren, Inc., Akron, Ohio
Industrial Ovens, Inc., Cleveland, Ohio
Marshall-Richards Machine Co., Inc., Trenton, N. J.
Standard Machinery Co., Mystic, Conn.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Inc., Manchester, Conn.

**MACHINERY—Taping**
American Insulating Mach'y Co., Phila., Pa.
Ets. Pourtier Frères, Romainville, France
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

**MACHINERY—Testing, Physical**
Scott Testers, Inc., Providence, R. I.

**MACHINERY—Tinning Wire**
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Steel Equipment Co., Cleveland, Ohio
Syncro Machine Co., Perth Amboy, N. J.
Wean Equipment Corp., Cleveland, Ohio

**MACHINERY—Tinsel Rolling Mills**
American Insulating Mach'y Co., Phia., Pa.

**MACHINERY—Trolley Wire**
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

**MACHINERY—Tube Mill, Cold Drawing**
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Hale & Kullgren, Inc., Akron, Ohio
Marshall-Richards Machine Company, Inc., Trenton, N. J.
Mettler Machine Tool, Inc., New Haven, Conn.

**MACHINERY—Twinning**
(See Mach.—Bunching)

**MACHINERY—Twisters, Wire**
Cook Manufacturing Co., The, Paterson, N. J.
Davis Electric Co., Wallingford, Conn.
Federal Manufacturing Co., Wallingford, Conn.
Haskell-Dawes Machine Co., Philadelphia, Pa.

**MACHINERY—Used**
National Machinery Exchange, New York, N. Y.
Wire & Textile Machy., Inc., Pawtucket, R. I.

**MACHINERY—for Wire Welding (See WELDERS—Butt and Spot)**

**MACHINERY—Winding Wire**
Eisler Engineering Co., Newark, N. J.
Entwistle, Jas. L., Co., Providence, R. I.
Federal Manufacturing Co., Wallingford, Conn.
New England Butt Co., Providence, R. I.
Standard Mill Supply, Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Inc., Manchester, Conn.

**MACHINERY—Wire Bending**
Eisler Engineering Co., Newark, N. J.
Kilmer, M. D., & Co., Cleveland, Ohio

**MACHINERY—Wire Drawing**
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Hale & Kullgren, Inc., Akron, Ohio
Marshall-Richards Machine Co., Inc., Trenton, N. J.
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N. Y.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio

**MACHINERY—Wire Forming**
Baird Machine Co., The, Stratford, Conn.
Kilmer, M. D., & Co., Cleveland, Ohio
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

**MACHINERY—Wire Rope**
Milton Machine Works, Inc., Milton, Pa.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Wrapping with Paper**
Angier Corporation, The, Framingham, Mass.
Marshall-Richards Machine C., Inc., Trenton, N. J.
Terkelsen Machine Co., Boston, Mass.

**MATERIAL HANDLING EQUIPMENT—**
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

**MILLS—Tandem, Rolling & Edging**
Wean Equipment Co., Cleveland, Ohio

**NAILS—Wire**
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Wickwire Brothers, Inc., Cortland, N. Y.

**OVENS—Cable Lacquering**
American Insulating Mach'y Co., Phila., Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Industrial Ovens, Inc., Cleveland, Ohio
Morrison Industries, Cleveland, Ohio
Westinghouse Electric Corp., Industrial Heating Div., Meadville, Pa.

**OVENS—Rod Bakers**
Carl-Mayer Corp., The, Cleveland, Ohio
Morrison Industries, Cleveland, Ohio

**OVENS—Welding Rod Coating**
Carl-Mayer Corp., The, Cleveland, Ohio
Industrial Ovens, Inc., Cleveland, Ohio
Morrison Industries, Cleveland, Ohio

**PAINT—Acid Proof**
Ceilcote Company, Cleveland, Ohio

**PAINT BONDING CHEMICALS—**
American Chemical Paint Co., Ambler, Pa.

**PAINTS—Heat Resisting**
American Chemical Paint Co., Ambler, Pa.
Solar Compounds Corp., Linden, N. J.

**PAPER—Creped Wrapping**
Angier Corporation, The Framingham, Mass.
Terkelsen Machine Co., Boston, Mass.

**PAPER—For Coil Wrapping and Corrosion Prevention**
Angier Corporation, The, Framingham, Mass.
Terkelsen Machine Co., Boston, Mass.

**PATENT ATTORNEYS—**
Lancaster, Allwine & Rommel, Washington, D. C.

**PAY-OUT SYSTEMS—(See MACHINERY—Take-Up & Pay-Out)**

**PHOSPHATE COATING CHEMICALS — (See COMPOUNDS — Phosphate Coating)**

**PICKLING COMPOUNDS—**
See (Inhibitors—Pickling)

**PICKLING—Hooks, etc. Acid Resisting**
Youngstown Welding & Eng'g' Co., Youngstown, Ohio

**PICKLING TANK LININGS—**
Chemsteel Construction Co., Pittsburgh, Pa.
Haveg Corp., Newark, Del.

**PIPES & FITTINGS—Acid Resistant**
Haveg Corp., Newark, Del.

**POTS—Lacquer**
Industrial Ovens, Inc., Cleveland, Ohio

**PRESSES—Hydraulic and Mechanical**
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Hale & Kullgren, Inc., Akron, Ohio
Standard Machinery Co., Mystic, Conn.

**PULLERS AND GRIPS—For Wire**
Morgan Construction Co., Worcester, Mass.
Scudder, E. J. Fdry & Mach. Co., Trenton, N. J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio

**REEL AND TENSION STANDS—**
Davis Electric Co., Wallingford, Conn.
Entwistle, Jas. L. Co., Providence, R. I.
Fidelity Machine Company, Inc., Philadelphia.
Industrial Ovens, Inc., Cleveland, Ohio
Kilmer, M. D., & Co., Cleveland, Ohio
Roll-A-Reel, Cincinnati, Ohio
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Mill Supply Co., Pawtucket, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Inc., Manchester, Conn.

**REEL CRUTCHES—**
Roll-A-Reel, Cincinnati, Ohio
Watson Machine Co., Paterson, N. J.

**REELS & SPOOLS—Aluminum Alloy**
Acrometal Products, Inc., Minneapolis, Minn.
Milton Machine Works, Inc., Milton, Pa.

# WHERE TO BUY, Continued

**For more complete information, consult the annual Wire and Wire Products Buyers' Guide.**

**REELS & SPOOLS—Annealing and Stranding**
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Howsam Spool Co., Aurora, Ill.
Milton Machine Works, Inc., Milton, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio

**REELS—Metal Bound**
Canada Reels, Ltd., Bury, Que., Canada
Durkee Mfg. Co., Pine River, Minn.
Howsam Spool Co., Aurora, Ill.
McCaskie, Inc., Wm., Westport, Mass.
North Anson Reel Co., No. Anson, Me.

**REELS—Plywood**
Carris Reels, Inc., Rutland, Vt.
Lavandier, Charles, Co., Inc., Pawtucket, R. I.
McCaskie, Inc., Wm., Westport, Mass.
Nelson Company, The, Baltimore, Md.
Winchester Reel Co., Ashuelot, N. H.

**REELS & SPOOLS—Steel (All Types)**
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Clark, J. L. Mfg. Co., Rockford, Ill.
Howsam Spool Co., Aurora, Ill.
Mason Can Company, East Providence, R. I.
Milton Machine Works, Inc., Milton, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio

**REELS—Wire Mill**
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg. Co., The, Hazardville, Conn.
Canada Reels, Ltd., Bury, Que., Canada
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co., Pine River, Mnn.
Dykrex Corp., Roos Tool & Mfg. Div., Newark, N. J.
Howsam Spool Co., Aurora, Ill.
Lavandier, Charles, Co., Inc., Pawtucket, R. I.
Mason Can Company, East Providence, R. I.
Milton Machine Works, Inc., Milton, Pa.
McCaskie, Inc., Wm., Westport, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Mettler Machine Tool, Inc., New Haven, Conn.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio
North Anson Reel Co., No. Anson, Me.
Winchester Reel Co., Ashuelot, N. H.

**REELS & SPOOLS—Wooden**
Acrometal Products, Inc., Minneapolis, Minn.
American Woodworking Co., Chicago, Ill.
Bridge Mfg. Co., Inc., The, Hazardville, Conn.
Canada Reels, Ltd., Bury, Que., Canada
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co., Pine River Minn.
Lavaudier, Charles, Co., Inc., Pawtucket, R. I.
Nelson Company, The, Baltimore, Md.
North Anson Reel Co., No. Anson, Me.
Winchester Reel Co., Ashuelot, N. H.

**REFRACTORIES—High Temperature**
Norton Company, Worcester, Mass.

**ROD BAKERS—(See Ovens—Rod Bakers)**

**RODS—Stainless Steel**
American Steel & Wire Co., Cleveland, Ohio
Pittsburgh Steel Co., Pittsburgh, Pa.

**RODS—Wire—Non-Ferrous**
Platt Bros. & Co., The, Waterbury, Conn.

**RODS—Wire, Steel**
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Indiana
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., Inc., New York, N. Y.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Company, Pittsburgh, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

**ROPE—Wire**
American Steel & Wire Company, Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Roebling, John A. Sons Corp., Trenton, N. J.

**RUST PROOF COMPOUNDS—**
(See Compounds—Rust Preventing)

**RUST REMOVING COMPOUNDS—**
(See Compounds—Rust Preventing)

**SALTS—Heat Treating, Descaling, etc.**
Holden, A. F., Co., The, Detroit, Mich.

**SATURATION SYSTEMS—**
Industrial Ovens, Inc., Cleveland, Ohio
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

**SOAPS—Industrial and Wire Drawing**
(See Compounds—Wire Drawing)

**SODIUM—for Descaling**
Holden, A. F., Co., The, Detroit, Mich.

**SPOOLS—(See Reels & Spools)**

**SPOOLS—Stamped Metal for Retail Wire Sales**
Clark, J. L. Mfg. Co., Rockford, Ill.
Mason Can Co., East Providence, R. I.

**STAMPINGS—Steel**
Acrometal Products, Inc., Minneapolis, Minn.
Mossberg Pressed Steel Corp., Attleboro, Mass.

**STRIP—Steel**
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Roebling, John A. Sons Corp., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

**TANKS—Compound**
Watson Machine Co., Paterson, N. J.

**TANKS—Pickling and Plating**
Ceilcote Company, Cleveland, Ohio
Chemsteel Construction Co., Pittsburgh, Pa.

**TESTERS — INSULATION (See MACHINERY—Spark Testers)**

**TESTING EQUIPMENT (See MACHINERY Testing, Physical)**

**TINNING PROCESS—**
Metal & Thermit Corp., New York, N. Y.

**TINSEL—Electric Conductor**
Montgomery Co., The Windsor Locks, Conn.

**TINSEL WIRE—Resistance, Lame, Decorative Cords Thread—Bare Copper, Silver and False Gold Coated, etc. (See TINSEL—Electric Conductor)**

**TOOLS—Wire Cutting**
Porter, H. K., Inc., Somerville, Mass.

**TRAMRAIL SYSTEMS—**
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

**TRANSMISSIONS—Variable speed (See Machy—Power Transmission)**

**TRAVERSES & DRUMS—For Reels**
(See Drums & Traverses)

**TRAVERSE MECHANISMS—**
Apco Mossberg Co., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Niles Steel Products Div., Republic Steel Corp. Niles, Ohio
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.
Wire Insulating Machy., Inc., Manchester, Ct.

**TUBE BENDERS AND FORMERS—**
Kilmer, M. D., & Co., Cleveland, Ohio

**VALVES & FITTINGS—Acid Resistant**
Haveg Corp., Newark, Del.

**VARNISHES—for Electric Wire**
N. E. Lacquer Co., E. Providence, R. I.
Solar Varnish Corporation, Linden, N. J.

**VULCANIZING PANS AND EQUIPMENT—**
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Wire Insulating Machy., Inc., Manchester, Ct.

**WELDERS—Spot and Butt**
Eisler Engineering Co., Newark, N. J.
Micro Products Co., Chicago, Ill.

**WIRE—Aluminum**
Elmet Division, North American Philips Company, Inc., Lewiston, Maine
Malin & Co., Cleveland, Ohio
Seneca Wire & Manufacturing Co., Fostoria, O.

**WIRE—Barbed**
Gerber, J., & Co., Inc., New York, N. Y.
Interlocking Fence Co., Morton, Ill.

**WIRE—Brass**
Chase Brass & Copper Co., Waterbury, Conn.
Spencer Wire Corp., Union, N. J.

**WIRE—Brush**
Gerber, J., & Co., Inc., New York, N. Y.
Spencer Wire Corp., Union, N. J.

**WIRE—Cast**
Youngstown Sheet & Tube Co., Youngstown, O.

**WIRE—Cold Heading**
American Steel & Wire Co., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., Inc., New York, N. Y.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling, John A. Sons Corp., Trenton, N. J.
Seneca Wire & Manufacturing Co., Fostoria, O.
Youngstown Sheet & Tube Co., Youngstown, O.

**WIRE—Copper**
Chase Brass & Copper Co., Waterbury, Conn.
Gerber, J., & Co., Inc., New York, N. Y.
Spencer Wire Corp., Union, N. J.

**WIRE—Flat, Fine**
Elmet Division, North American Philips Company, Inc., Lewiston, Maine
Gerber, J., & Co., Inc., New York, N. Y.
Montgomery Co., The, Windsor Locks, Conn.

**WIRE—Forming**
Erie Iron & Supply Corp., Erie, Pa.
Pittsburgh Cut Wire Co., Pittsburgh, Pa.

**WIRE—Galvanized**
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., New York, N. Y.

**WIRE—Manufacturers**
American Steel & Wire Co., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Continental Steel Corp., Kokomo, Ind.
Gerber, J., & Co., New York, N. Y.
Johnson Steel & Wire Co., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling, John A. Sons Corp., Trenton, N. J.
Seneca Wire & Manufacturing Co., Fostoria, O.
Spencer Wire Corp., Union, N. J.
U. S. Steel Co., N. Y., N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

**WIRE—Music**
American Steel & Wire Co., Cleveland, Ohio
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Malin & Co., Cleveland, Ohio
Seneca Wire & Manufacturing Co., Fostoria, O.
Specialty Wire Co., Inc., Worcester, Mass.
Spencer Wire Corp., Union, N. J.

**WIRE—Nickel Silver and Phosphor Bronze**
Malin & Co., Cleveland, Ohio
Chase Brass & Copper Co., Waterbury, Conn.

**WIRE—Oil Tempered**
Pittsburgh Steel Co., Pittsburgh, Pa.

**WIRE—Spring**
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., New York, N. Y.
Johnson Steel & Wire Co., Inc., Worcester.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Seneca Wire & Mfg. Co., Fostoria, Ohio
Specialty Wire Co., Inc., Worcester, Mass.
Youngstown Sheet & Tube Co., Youngstown, O.

**WIRE—Stainless Steel**
American Steel & Wire Co., Cleveland, Ohio
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Specialty Wire Co., Inc., Worcester, Mass.

**WIRE—Steel—Also Coppered and Galvanized Steel**
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Erie Iron & Supply Corp., Erie, Pa.
Gerber, J., & Co., New York, N. Y.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Seneca Wire & Mfg. Co., Fostoria, Ohio
Spencer Wire Corp., Union, N. J.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

**WIRE—Straightening and Cutting**
Erie Iron & Supply Corp., Erie, Pa.
Pittsburgh Cut Wire Co., Pittsburgh, Pa.
Wickwire Brothers, Inc., Cortland, N. Y.

**WIRE—Tungsten**
North American Philips Co., Inc., Allied Products Division, New York, N. Y.

**WIRE—Zinc**
Platt Bros. & Co., The, Waterbury, Conn.

**WRAPPING PAPER—Creped (See PAPER—Creped Wrapping)**

**YARNS & TAPES—**
Belding Hemingway, New York, N. Y.
Glass Fibers, Inc., Toledo, Ohio

**YARN TESTERS—**
Heineman Corp., Oscar, Chicago, Ill.
Scott Testers, Inc., Providence, R. I.

# The WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON 3, NEW JERSEY, U. S. A.

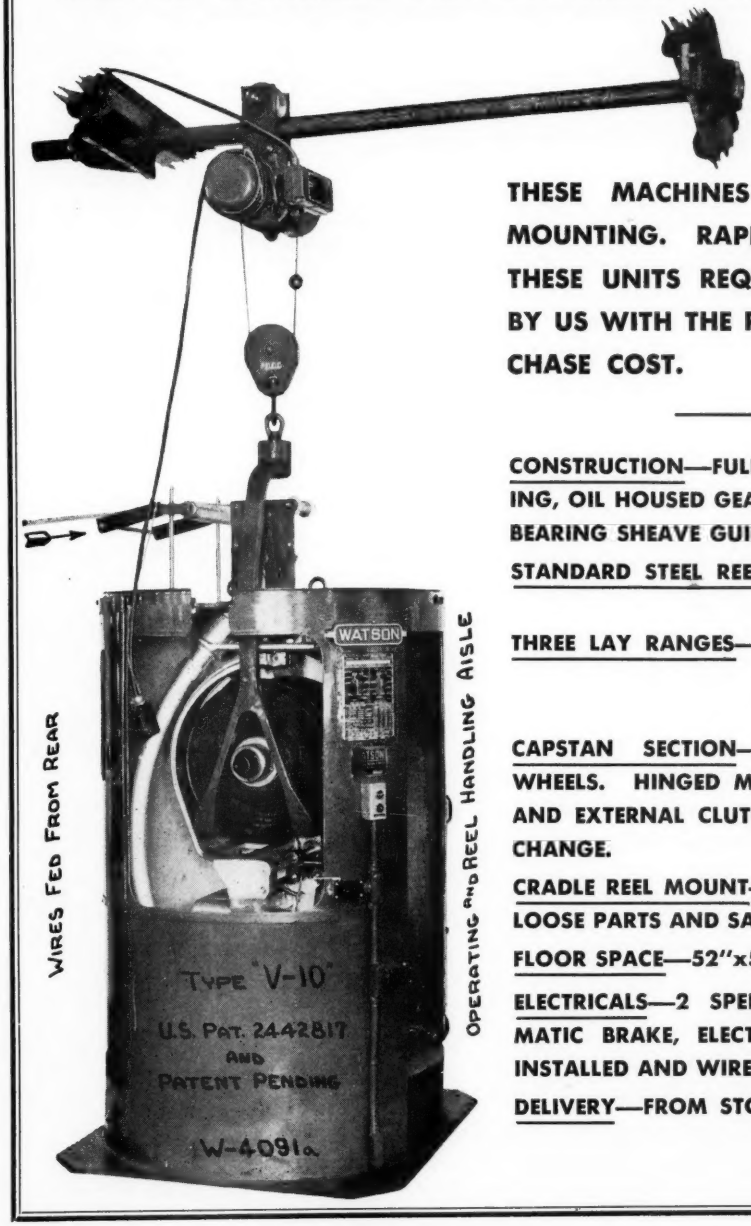
ELECTRICAL WIRE AND CABLE, WIRE ROPE, CORDAGE
AND MASTICATING MACHINERY MANUFACTURERS

WATSON

# WATSON BUNCHER "V-10"

PATENT PENDING

**THESE HEAVY DUTY UNITS, DESIGNED TO MEET THE DEMAND FOR INCREASED CAPACITY AND PRODUCTION ARE NOT ONLY USED FOR FINE AND HEAVY ELECTRICAL WIRE BUNCH STRANDING, BUT ALSO FOR MANY PRODUCTS ABLE TO ABSORB TORSION, i.e., GALVANIZED STEEL CLOTHESLINE, TELEVISION GUY WIRE, PAPER AND YARN TWISTING AND BUNCH CABLING OF SMALL PLASTIC INSULATED WIRES. MINIMUM FLOOR SPACE REQUIRED MAKE THESE MACHINES IDEALLY SUITED FOR ROW MOUNTING. RAPIDLY INCREASING DEMAND FOR THESE UNITS REQUIRES QUANTITY PRODUCTION BY US WITH THE RESULTING EFFECT OF LOW PURCHASE COST.**




CONSTRUCTION—FULLY GUARDED, ALL STEEL, BALL BEARING, OIL HOUSED GEARING AND SIMPLEST THREADING BALL BEARING SHEAVE GUIDES.

STANDARD STEEL REELS—No. 9-22"x11" (650-LB. CU.)
No. 10-24"x14" (1000-LB. CU.)

THREE LAY RANGES—"LOW"—.64" TO 3.21"
"STD."—.79" TO 4.02"
"HIGH"—.95" TO 4.81"

CAPSTAN SECTION—HEAVY DUTY DOUBLE GROOVED WHEELS. HINGED MOUNT SIMPLIFIES LAY GEAR CHANGE AND EXTERNAL CLUTCH SHIFT SIMPLIFIES HAND OF TWIST CHANGE.

CRADLE REEL MOUNT—OVERHUNG SPINDLE TYPE WITH NO LOOSE PARTS AND SAFETY LOCK.

FLOOR SPACE—52"x59".

ELECTRICALS—2 SPEED MOTOR AND CONTROLS, AUTOMATIC BRAKE, ELECTRIC STOPS, SAFETY SWITCHES, ETC., INSTALLED AND WIRED READY TO RUN.

DELIVERY—FROM STOCK OR STOCK IN PROCESS.

4-53

# Typical EF Installations

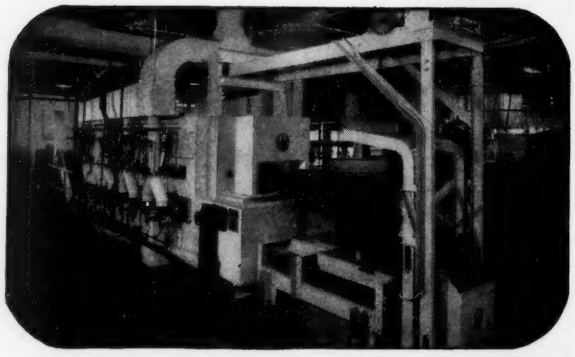
For the utmost in dependable, efficient, low cost service, specify an EF furnace. Built in roller hearth, roller rail, chain belt, car type, wire belt and many other designs. Complete with special atmosphere generators and material handling facilities. Gas fired, oil fired, or electrically heated for any heating or heat-treating operation — any process — any product — and any capacity requirement. Let the EF engineers, with their long and successful experience in engineering and building furnaces, work with you on your next heat treating job.

**THE ELECTRIC FURNACE COMPANY**

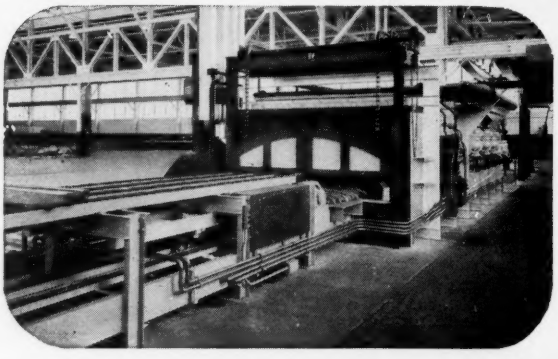
*Gas Fired, Oil Fired and Electric Furnaces*

**Wilson Street, Salem, Ohio**

Canadian Associates • CANEFCO LIMITED • Toronto 1, Canada



Small parts, headed, drawn, forged or stamped are heat-treated without scale or decarburization—uniformly and economically—in EF chain belt furnaces. Capacities to meet any requirement.

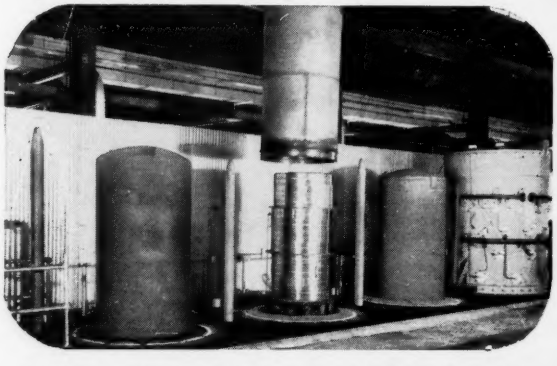
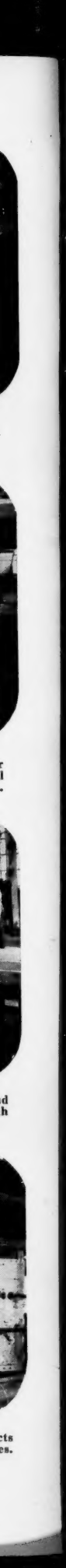


Bars and billets are scale-free heated for rolling, drawing or other processing in EF pusher, rotary and other types of special atmosphere furnaces. Any capacity, atmosphere or temperature.

Continuous annealing of steel strip shortens the heating cycle and improves the drawing qualities. Single or multiple strands to 54" or wider. Capacities to 28,000 lbs. per hour or more.

Nickel-silver and other alloy wire and strip is clean and scale-free annealed in EF furnaces. Furnished complete with special atmosphere and desulphurizing units.

Ferrous and non-ferrous wire on reels, spools, coils and strands is bright annealed uniformly and continuously in EF special atmosphere furnaces. Capacities for any requirement.



Carbon, alloy and non-ferrous wire, strip and other products are annealed, carburized or nitrided in EF bell type furnaces. Cycles readily changed to suit the process.